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THE AMERICAN ARCHITECT AND BUILDING NEWS

ARCHITECTVRE

ENGINEERING

DECORATION

CONSTRVCTION

NEW YORK
TIMES BUILDING, BROADWAY AND 42D STREET

REGULAR EDITION

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CONTENTS

TEXT PP. 117-124 and V.-XVII.

SUMMARY.

AMERICAN ARCHITECTURE.

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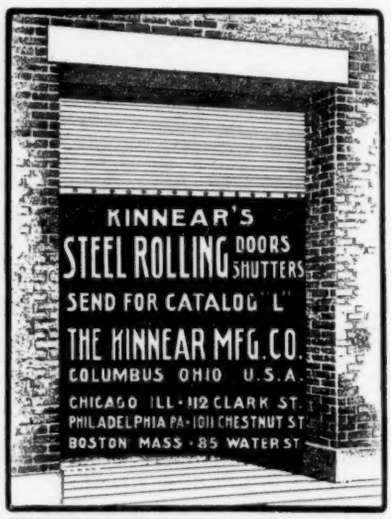

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Alphabetical List of Advertisers.

(For Classified List see Page 18.)

A

American Asphaltum & Rubber Co..x
American Mason Safety Tread Co..xii
American Sheet and Tin Plate Co. e-o-w, xiii
Andrews, A. H., Co. x
Architect and Contract Reporter.....ii
Art Metal Construction Co.....x
Associated Expanded Metal Co.....xvi
Atlas Portland Cement Co..o-a-m, xix

B

Barrett Mfg. Co..... vi
Batchelder & Co., C. H.....xvii
Benedict & Burnham Mfg. Co. e-o-w, xix
Berger Mfg. Co.....iv
Building News. xiii
Butcher Polish Co.....e-o-w, ix

C

Cairns, Hugh.....xvii
Campbell, Walter M.....xii
Chicago & Alton Ry.....xviii
Crane Co.....ix
Cudell, F. E.....e-o-w, xvii
Cummings Filter Co. xix
Cutler Mfg. Co. iv

D

Dadmun Leon E.....xvii
Deane, E. Eldon.....xii
Dixon Crucible Co., Jos.....ix

E

Elevator Supply and Repair Co.....iii
Elston, A. A.....xvii
Erickson Electric Equipment Co...xvii

F

Fisher Co., Robert C.....iii
French & Co., Samuel H.....ix
Frink, I. P.....ii

G

Gilbreth, Frank B. xvii
Gilbreth Seam-face Granite Co....xvii
Globe Ventilator Co.....xix
Goerz, C. P.....v
Guastavino, R., Co.....o-a-m, xiii
Gurney Heater Mfg. Co.....xx

H

Hartmann Bros. Mfg. Co. xiii
Harvard University.....iii
Hayes, Geo.....v

I

Illinois Steel Co.....xx
Imperial Expanded Metal Co.....xvii

J

Jackson Co., Wm. H. xx
Jenkins Bros.....x
Johnson & Co., H. A.....xvii
Jones, T. W.....e-o-w, v

K

Kinnear Mfg. Co., The.....ii

L

Lane, John vii
Lawrence Scientific School.....iii
Loomis-Manning Filter Co.....iii
Lord & Burnham Co.....v

M

Mass. Institute of Technology.....iii
Miller & Bro., James A.....v
Mississippi Wire Glass Co. x
Morrill & Whiton Construction Co..xvii
Merrill, E. L. xii
Moss, Chas. E.....xvii
Mott, J. L.....xvi

N

National Fireproofing Co.....v
Neuchatel Asphalt Co.....x
New England Tank and Tower Co. e-o-w, xvii
New Jersey Zinc Co.....o-a-m, ix
New York Belting & Packing Co. e-o-w, xi
Northwestern Terra Cotta Co.....xii

O

Ohio State University.....iii
Okonite Co. (Ltd.).....e-o-w, iv

P

Phillips, A. J., Co. iv
Pratt Institute iii

R

Richey, Browne & Donald.....x
Rider-Ericsson Engine Co.....xvi
Rutan, W. L.....xvii

S

Samson Cordage Works.....e-o-w, x
Shirley Radiator Co.....xii
Silver Lake Co.....xvii
Simpson Bros. Corporation.....xvii
Sleep, Elliot & King Co.....xvii
Smith & Co., Edward.....iii
Smith Co., H. B.....e-o-w, xvi
Society of Beaux-Arts Architects....iii
Spaulding Print Papaer Co.....xvi
Standard Fire-escape & Mfg. Co....xvii
Standard Sanitary Mfg. Co....e-o-w, iv
Sturtevant Co., B. F.....xi

T

Taylor Co., N. & G.....e-o-w, vii
Taylor, J. W.....xii
Thorn, J. S. Co.....e-o-w, v
Troy Laundry Machinery Co.....xx
Truss Metal Lath Co.....xvii

U

University of Pennsylvania.....iii
United States Foundry and Sales Co.xvii
U. S. Mineral Wool Co.....v

V

Valle & Young.....xx

W

Warren Chemical & Mfg. Co. x
Washington University.....iii
Williams, John xiii
Winslow Bros. Co., The.....xix
Wister, L. & R., & Co. ..o-a-m., vii

Y

Yale & Towne Mfg. Co. xiii

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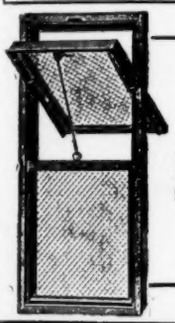

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INDUSTRIAL INFORMATION.

"Steelsects" is short for "sectional cabinets built of steel," and in a pamphlet so named, the Berger Mfg. Co., of Canton, O., describe and illustrate very fully the various forms of fireproof filing-cases, card-index cases and drawer-cases, which they manufacture.

The Crane Co., of Chicago, has recently issued its "Advance Circular No. .01" of steam and oil separators, in the form of 26 sheets, 10 by 13 inches, printed on white enameled paper, and illustrated with half-tones. It describes horizontal, vertical, angle and distributing separators in sizes from 1 to 30 inches.

The Automatic Mail Delivery Co., Times Building, New York, issues a pamphlet which shows their method of delivering mail matter to the various floors of office buildings and apartment houses. The object of the system is to eliminate any need for dependence on elevator and hall attendants in delivering letters; that is, to let them pass automatically from the hands of the postman to the apartment or office of the person addressed. The pamphlet describes one particular installation in a New York apartment house. A steel tray with metal boxes is moved by electric power up and down a well or chute. At the foot of this chute, on the ground floor, is a door which is opened by the postman. He then drops the mail into the boxes of the persons addressed, and starts the mechanism. The boxes drop off at the apartments to which they belong and their contents fall into a locked receptacle inside the apartment. As the carrier descends, it picks up the boxes automatically and takes them again to the foot of the chute. The whole device seems neat and compact and the space required to install it quite small.

"Corrugated Bars for Reinforced Concrete," of the type handled by the St. Louis Expanded Metal Fireproofing Co., Century Building, St. Louis, Mo., are dealt with in a new 170-page pamphlet which that company is sending out. The many photographs of important structures, in the construction of which expanded metal and corrugated steel bars form the tensile element, are proof of the increasing importance of reinforced concrete construction. A large part of the pamphlet deals with engineering structures, but the examples of arched bridges will be interesting to architects—especially those examples in which is evidenced a tendency to get away from that mode of external treatment which makes work in reinforced concrete look like ashlar masonry. A number of detail drawings of floors, foundation walls and footings in reinforced concrete and a comparison of their cost with other modes of construction will also prove useful to the architect.

BUILDING NEWS.

(The editors greatly desire to receive information from the smaller and outlying towns as well as from the larger cities.)

Akron, O.—The preliminary plans submitted by J. Milton Dwyer, of Cleveland, for the courthouse, have been approved, and working plans will be prepared at once. Probable cost, $275,000.

Anniston, Ala.—Plans are stated to have been prepared by Breeding & Whilldin, Birmingham, for a Presbyterian Synodical College, to be erected here. Cost, $85,000.

Atlantic City, N. J.—It is stated that Josiah White & Sons, of the Marlborough House, have had plans prepared for a wing to be erected at a cost of about $500,000.

Berkeley, Cal.—Work will begin at once on the foundation of the new library for the University, for which the late Charles S. Doe left a bequest of $700,000.

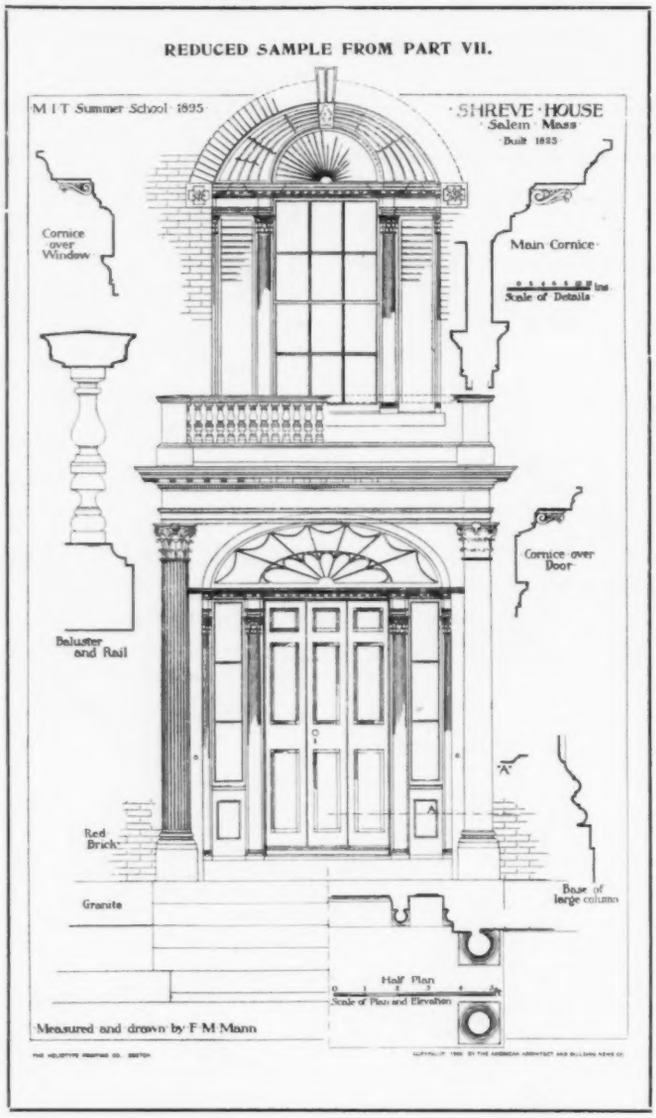
Birmingham, Ala.—The Warrant Warehouse Co. has been organized with $200,000 capital stock to erect a cotton warehouse. H. K. Miller, secretary.

Birmingham, Ala.—The contract to erect a block of stone flats, to cost $300,000, has been awarded T. C. Thompson & Bros.

Continued on page vii.

The Georgian Period

An Encyclopaedia of Colonial Architecture



THE most important feature of this work, and the one that separates it from all other publications relating to the subject of so-called colonial architecture, is indicated very inadequately by the adjoining illustration. This is a reduced fac-simile page, one-fourth the area of the original, showing one sheet of the measured drawings, which constitute the real framework of the book. ¶ There are in all one hundred and eighty-one sheets of this sort; many of these containing much more information, as the simpler ones are necessarily chosen for reduction. ¶ Besides these drawings, there are sixty-three gelatine prints and 108 half-tone plates, and over five hundred text illustrations.

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BUILDING NEWS.

Continued from page v.

Baltimore, Md.—We learn that within a year a hospital will be erected in the northwestern part of the city, fitted in the most modern manner and with all the latest surgical appliances. It is stated that the building will be of substantial design, and will be an ornament to the neighborhood in which it is located. The incorporators of the new institution are Drs. William S. Gardner, Albertus Cotton, Lee Cohen, Edward Bernstein and A. G. Barrett.

Bloomington, Ind.—The Board of Trustees of the State University of Indiana plans for a library building, to cost $100,000. J. W. Cravens, secretary.

Boise, Idaho.—It is reported that the Senate has passed a bill providing for the erection of a new $350,000 capital in Boise.

Brookline, Mass.—It is stated that the town will be asked to appropriate $201,484 for public schools.

Bridgeport, Conn.—We are informed that the heirs of Nathaniel Wheeler, who are building an 8-story block on the west side of Main St., between Fairfield Ave. and Elm St., to be known as "The Security Building," have plans in course of preparation for five other business blocks to be erected on Main St., between Fairfield Ave. and Chapel St. The approximate cost of the six buildings is estimated at $500,000. Lucius T. Bridge is consulting engineer and William H. Day is preparing the plans.

Brooklyn, N. Y.—The 15th Street Baptist Church Society met recently at 15th St. and 4th Ave., for the purpose of authorizing the trustees and Building Committee to go ahead with the work on their new edifice. Resolutions were adopted rescinding all other plans and rearranging the old one. The new building is to be of buff brick and stone, hardwood finish, steam heated, and stained glass windows.

A Committee of Five, consisting of Geo. A. Stanton, Henry R. Jones, A. Abraham, Willis L. Ogden and Walter C. Humstone, has been appointed to devise ways and means for erecting a new building for the Brooklyn Society for the Prevention of Cruelty to Children, which the society finds it necessary to build, in order that it may care for the children which come to it for shelter.

At the annual meeting of the Bedford Presbyterian Church, corner Nostrand Ave. and Dean St., it was practically decided to build a new church on the present site. A resolution was adopted, calling for the appointment of a committee of nine to submit to the congregation plans for a new church building, to be erected and ready for occupancy by the winter of 1906-07.

Buffalo, N. Y.—A site for the new union station will probably be selected within a few weeks, and construction will then commence without delay.

Plans have been drawn for a Universalist Church edifice. The structure will be of dressed limestone, 80 x 100 ft., with a seating capacity of 500 persons. S. W. and A. A. Kemp, of New York and this city, are the architects. Estimated cost, $90,000.

Chicago, Ill.—Plans have been prepared by Webster Tomlinson for a warehouse to be erected by Mrs. Altha E. Best, on Jackson Boulevard. Cost, $300,000. Address, F. W. McKinney, Mgr. Royal Trust Co., Loan Department.

It is announced that plans are to be prepared at once for a building, which is to include the home of the Board of Education and a commercial high school, to be erected at Harrison St. and Plymouth Court. Cost, $500,000.

C. A. Eckstrom, 1001 Tacoma building, has drawn plans for a furniture warehouse, to be erected at 460 Illinois St., for the Furniture Exhibition Co., at 1411 Michigan Ave. Cost, $500,000.

Cincinnati, O.—Tietig & Lee, Commercial Tribune building, are at work on plans for a new building for the technical department of Cincinnati University. Estimated cost, $75,000.

D. H. Burnham & Co., architects, Railway Exchange building, are preparing plans for a 10-story building, 40 ft. by 120 ft., for the Fourth National Bank. Cost, $200,000.

Gustave Drach, Union Trust building, has been commissioned to prepare plans for a 4-story concrete building to be erected at 9th St. and Broadway, by the Live Oak Distilling Co. Probable cost, $50,000.

Frank M. Andrews, Conover building, Dayton, has prepared plans for a $1,000,000 hotel for the Cincinnati Realty Co.

Cleveland, O.—Plans are under way in the office of Geo. B. Post, 33 E. 17th St., New York, for a 4-story bank building,

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COVINGTON, KY.—Schofield & Walker have drawn plans for a school building. Cost, about $80,000.

CEDAR RAPIDS, IA.—A meeting of the Iowa Council will be held in this city in June, when the matter of the location of a $200,000 home for the United Commercial Travelers of America will be decided.

CHICAGO, ILL.—The George Mesta Machine Co. has the contract for building a plant for the Illinois Steel Co. at S. Chicago. The plant will include 28-in., 32-in. and 40-in. mills. Cost, $250,000.

DENVER, COLO.—It is reported that Federal Judge Hallet, administrator of the will of the late George W. Clayton, has decided to devote $1,000,000 of the $3,000,000 left to the public to the building of homes to be sold on easy terms. The estate owns 80 acres in a residential district inside the city limits, on which it is planned to erect 400 homes, at a cost of $800,000.

DANVILLE, VA.—We are informed that the Sublett Lithia Water Co. will erect a $150,000 hotel at Sublett Lithia Springs this Summer. B. L. Sublett is secretary.

DAYTON, O.—It is reported that the Y. M. C. A. will erect a $350,000 building at 3d and Ludlow Sts. E. L. Shuey, president.

DENVER, COL.—Murto & Humphries will erect a $25,000 building, at Gaylord St. and 17th Ave.

DETROIT, MICH.—A building permit has been granted Edwin Hewitt, candy manufacturer, for the erection of a 6-story office building at 15th and Arapahoe Sts., to cost $100,000. Plans by Gove & Walsh, 55 McPhee building.

It is reported that Partridge & Blackwell will erect a $1,000,000 department store on block on Farmer St., between Gratiot and Monroe Aves.

FORT MONROE, VA.—Paul J. Pelz, Corcoran building, Washington, D. C., has drawn plans for a military school for this place. Cost, $250,000.

FLATBUSH, L. I.—It is stated that the Health Department proposes to employ $1,500,000 in building a new hospital in the Flatbush section for the isolation of contagious diseases. One-third of the sum thus to be expended is already available.

INDIANAPOLIS, IND.—It is stated that the directors of the Commercial Club will ask the management of Winona National Technical Institute to set aside part of the arsenal grounds for a new armory for the four companies of Indiana National Guard stationed at Indianapolis. The Commercial Club also intends to secure sites if possible for several factories that contemplate locating in Indianapolis. A New Industries Committee of the club has been organized to investigate the needs of more than 15 factories that have applied for admission to the city through the medium of the Commercial Club.

INDIANAPOLIS, IND.—It is stated that Clarence Martindale, Indiana Trust building, has submitted plans for the new Industrial School for Girls, for which the Legislature recently appropriated $235,000. John T. Stout, of Paoli, and E. M. Campbell, of Indianapolis, are members of the building commission.

JACKSON, TENN.—The erection of a County and City Hospital, to cost $50,000, is reported under consideration.

JAMAICA, L. I., N. Y.—Report states that members of the Jamaica Presbyterian Church are contemplating the erection of a chapel to cost $20,000, and in the near future the erection of a new edifice to cost $100,000.

JERSEY CITY, N. J.—Plans have been prepared for the erection at Belmont and Monticello Aves of a 2-story brick building for the Golf Club.

Plans have been drawn for the branch post-office, to be located at the Grand St. junction. It will be of brick, 2 stories high. The entire lower floor will be used as offices.

KNOXVILLE, TENN.—It is reported that the Knoxville Banking Company will build an 8 to 12-story fireproof bank and office building after plans by Ben. T. Broome.

We are informed that the Mechanics' National Bank will erect a 10-story bank and office building of fireproof, steel construction. Thos. H. Morgan, Atlanta, Ga., architect.

LOS ANGELES, CAL.—Fred. R. Dorn, Douglas building, has prepared plans for a brick building to be erected on Olive St. Cost, $100,000.

A. B. Benton, 114 Spring St., is drawing plans for a Y. M. C. A. building. Cost, $300,000.

We are informed that the California Cancer Sanitarium Association has been incorporated with a capital stock of $200,000 and will begin at once the erection of a hospital building to cost about $100,000.

We are informed that no definite plans have as yet been prepared for proposed new public library.

LOCKPORT, N. Y.—Directors of the Farmers' and Mechanics' Savings Bank have

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purchased the Lincoln building, corner of Locust and Main Sts. On the site the bank people will erect a 6-story brick structure, to be used for banking and general office purposes.

Long Beach, Cal.—The plans submitted by Architect Harrison Allbright, of Charleston, W. Va., for the new hotel building at Long Beach have been accepted, and the architect has been instructed to prepare the specifications and drawings for the erection of the building. The hotel will be of reinforced concrete construction and will be fireproof.

Los Angeles, Cal.—It is reported that the proposition to issue bonds to the amount of $520,000 for the construction and equipment of new grammar school buildings in the city was carried at the recent election. At the same time the question of issuing bonds to the amount of $260,000 for the purchase of additional land and the erection and equipment of another high school building adjoining the present building; also for the purchase of additional land and for the equipment of the Polytechnic High School on Washington St. resulted in a vote of 2,467 for and 297 against.

It is stated that the local freight depot of the San Pedro, Los Angeles and Salt Lake Railroad line is to be enlarged to nearly four times its present size, to accommodate the increased business that will come with the opening of the line for transcontinental traffic. The additions as approved by the company officials, include an extension 300 ft. long and 36 ft. in width on the north end and one 203 ft. long and about 35 ft. wide on the south end.

Architect A. F. Rosenheim is taking bids on the structural steel work for the new Elks building.

Architects Morgan & Walls are preparing plans for a 6-story mercantile building, to be erected on Broadway, between 4th and 5th Sts., by Susanna Van Muys. The building will have a frontage of 90 ft. Upon its completion it will be occupied by the Parmelee-Dohrman Co.

Manitowoc, Wis.—The plans for the new courthouse to be erected at Manitowoc will be on exhibition at the Builders' and Traders' Exchange, Milwaukee, in the near future, and it is said to be probable that the contract will be awarded to a Milwaukee firm. The building will be built of stone and is to cost about $100,000.

Marysville, Cal.—R. Dewar, a San Francisco builder, has secured the contract to erect the library building provided for by John Q. Packard as a gift to Marysville. The contract price is $66,300, and the building is to be completed in 210 working days.

Mobile, Ala.—A union passenger station is to be built at Mobile, costing approximately a quarter of a million dollars.

Nashville, Tenn.—It is reported that the Willcox building is to be remodeled and fitted up as a home for the *Banner*. J. E. R. Carpenter, of New York City, is architect having these improvements in charge.

Norway, Ohio.—The First National Bank and the Benton County Bank will each erect a bank building here.

Macon, Ga.—It is stated that W. H. McDoel, of Chicago, Ill., president of the Chicago, Indianapolis & Louisville Ry., is interested in the erection of a 10-story steel office building at Cherry and 2d Sts. Cost, $:00,000.

Manitowoc, Wis.—Plans have been drawn by C. H. Tegen, Metropolitan building, for Manitowoc County courthouse. It will cost about $150,000.

Medical Lake, Wash.—J. K. Dow, Spokane, is drawing plans for a building for the Washington Hospital for Insane, to be erected here; appropriation, $55,000.

Milwaukee, Wis.—It is reported that Buemming & Dick, architects, Pabst building, have been commissioned to prepare revised plans for a North Division high school. $135,000 available.

Minneapolis, Minn.—We are informed that John Clark and Elizabeth Lyman will erect a 5-story brick block at 529 Hennepin Ave. Plans by Kees & Colburn, 603 Kasota block. Cost, $100,000.

Madison, Wis.—A new Catholic Church is to be built at Madison, east of the university, the new congregation being formed by a part of St. Mary's congregation, which is too large for the church.

Archbishop S. G. Messmer and other prominent Catholics of the middle west are interested in a project to found and maintain a Catholic Chautauqua on a large scale. The plan embraces cottages, a big hall and attractive grounds.

Montreal, Que.—It is reported that the directors of the Windsor Hotel will erect a new hotel on the site of the Windsor Hall. The building will be 60 x 235 ft., 8 stories high, fireproof. Cost, about $1,500,000.

Morgantown, W. Va.—It is stated that the contract for building new theatre and business block, to cost $100,000, has been let to Weaver & Zeverly, Morgantown.

Montgomery, Ala.—Nicholas Ittner, Atlanta, Ga., has the contract for erection of the New Exchange Hotel. Plans by W. F. Denny, Atlanta. Cost, $400,000. Owners, the J. E. Hickey Hotel Co., of Atlanta.

McKees Rocks, Pa.—C. H. Nuss has the contract for 40 brick houses at McKees Rocks. Cost, $140,000.

McMechen, W. Va.—W. B. Leech, president, and C. L. Evans, secretary, of the Board of Education of the District of Union, will take bids until April 26 on 15-room brick and stone school building with concrete foundation. Plans by Architect Charles D. McCarty, Reilly build-

Continued on page xi.

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THE Courthouse Commission of New Orleans invites plans from architects for a courthouse to be built in the City of New Orleans at a cost not to exceed eight hundred thousand dollars ($800,000); plans to be delivered to the Commission at its office, Room 1201, Hibernia Bank Building, not later than June 15, 1905. For the three plans selected by the Commission prizes will be awarded. The Commission reserves the right to reject any and all plans.

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CONTENTS

Summary: 117, 118
The Ownership of Architects' Drawings: Gibbon *vs.* Pease Lost on Appeal.—Report on the Recent Collapse of Buildings in New York.—The Attitude in the Matter of the Superintendent of Buildings.—Mr. Reginald Blomfield Made an Associate of the Royal Academy.—Competition for Public Monument at Lima, Peru.
American Architecture. 119
Heating and Ventilation.—V. 121
Illustrations: 123
Design for Proposed Country Church and Parish-House.—Branch of the New York Public Library at Tompkins Square, 135th St. and Rivington St.—Williamsburgh Branch: Brooklyn Public Library.—Spring House and Bottling Works, Poland Springs, Me.—House at Darmstadt, Germany.
Additional: View from Southeast: Rogers Memorial Church, Fairhaven, Mass.
Notes and Clippings: 123
Societies and Miscellany: . . . . . V.

IT is disappointing to learn that the case of Gibbon *vs.* Pease, to which we referred recently, has gone against the hope of the profession and that the matter of the ownership of architects' drawings is left in the same unsatisfactory condition as before the case was heard on appeal. It was the hope of the architectural societies in England and their allies that, through the pleadings in this case, the ruling in the case of Ebdy *vs.* McGowan, which has of late been the leading decision, might at last be overthrown. Unfortunately the Lords Justices of the Court of Appeals declared specifically that the principles involved in Gibbon *vs.* Pease were similar to those involved in Ebdy *vs.* McGowan, and that therefore they must decide in conformity with the decision reached in that case, namely, that unless the owner received the drawings he need not pay the architect for his work. The mistake made in all these cases has been the introduction of testimony showing that it is the "custom" amongst architects to retain drawings as mere instruments of service, for the courts will always hold, and we think rightfully, that no trade or profession can establish laws or rules binding on the general public without that public's knowledge and consent. The plea that the architect sells service as other professional men do and not drawings as chattels is a safe one, and the argument should turn about that mainly, and care should be taken not to bring forward the allegation that drawings are made merely for the architect's own convenience since, if he chose, he could erect the building and give the client the service he pays for without ever setting pencil to paper. The argument is too fallacious and hurts the case immeasurably. It is true that, given plenty of time and being personally present on the job at all times, an architect might erect a pretty complicated building, without making formal and complete drawings. But it is still more true that, as architectural work is actually executed, unless very complete and elaborate drawings are made it would be quite impossible to have buildings erected by ordinary building mechanics for the sum and within the time named in the contract.

THERE must have been something thoroughly unfortunate in the words or the manner of the counsel who presented the early pleadings in these architect's drawings cases. The attitude, manner and words of the court testify to an impatient intolerance that seems to indicate that the court's temper had been unnecessarily ruffled. This is unfortunate, of course, and more than this it seems to us it must have been quite unneeded, for the case suggests that had the simple *argumentum ad hominem* been used the result would have been different. There are distinct points of resemblance between the services rendered by an architect and by a lawyer. In each case the client pays the professional man merely to produce a result—by what means is immaterial and unstated—in one case to create a structure and in the other to win a suit. The lawyer after winning, or losing, his case, never thinks of handing to his client with his bill the brief and pleadings he has used. No, these are neatly docketed and then dropped into the tin box marked with the client's name and stored to gather dust on the lawyer's shelves. Why, then, should the lawyer, when his time comes to sit on the bench, require the architect to deliver over to his client the brief and pleadings—the drawings that is—of which the architect had made use? One would think that the analogy must be apparent even to the legal mind and also the greater commercial injustice of the requirement. The lawyer would rightfully decline to surrender his papers—there is matter therein that may be of service to him later—and yet those particular pleadings would in all probability never be of use thereafter to his client, even be he never so litigious. On the other hand the court requires an architect, who has agreed to perform only a single service, for which service alone he has been paid, to surrender material which enables the duplicating of the service by the client, if he chooses, innumerable times. By taking the position it does, the court surely makes itself *particeps criminis* before the fact in certain possible contingencies.

IT is very unfortunate that Ebdy *vs.* McGowan has become a leading case, because the court there had before it the most unbusinesslike and therefore most defenseless of professional men, a clergyman, and the most businesslike, an architect, and good will in such cases usually inclines to the weaker side. Moreover the case was one of abandonment, that is, the result the architect was employed to achieve never eventuated. After the plans for the vicarage had been prepared, the clergyman changed his mind, deciding not to build, and asked for his bill and the drawings. The architect furnished the bill but retained the drawings, and when the bill remained unpaid sued to recover. His course in so doing was an ultra foolish one, for it should have been obvious to him that a court would be likely to rule that if a man be forced to pay he must receive something in return. There obviously could be no tangible result in the shape of a vicarage and therefore the clergyman must be entitled, for his payment, to the next most

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tangible thing, the drawings. Moreover, the possibility of abandonment was foreseen and provided for at the time the agreement between the two parties was made, and, knowing how clients usually feel in such cases and knowing, of course, the temperamental peculiarities of clergymen, the architect must have entered on his work with a clear understanding that in case the work did not proceed delivery of the drawings would be required. In similar cases of abandonment architects would be wise to surrender the drawings in return for an undertaking in which the client agrees that, in case of a revival of the enterprise, the work shall be carried on only by the original designer. The case of Gibbon *vs.* Pease was one of the more usual kind; here the entire result the client desired had been accomplished, and so the court was not under moral compulsion to see that he "got something" for his money and hence must have the drawings at least. His demand for them and the court's final award may, therefore, be considered purely academic. But, as it was a mere case of alteration, the architect might safely have surrendered the drawings without undergoing the risk that the client might use them on another job, and so be in a position to perpetrate a constructive fraud on his professional adviser. The architect's refusal to surrender the drawings was, therefore, also purely academic, and the case could have been presented as a matter of principle on one hand and the other, so discussed and so decided. Unfortunately it was discussed, considered and decided not on its own merits but in the light of the earlier case of Ebdy *vs.* McGowan, where both the physical conditions and the moral aspects were distinctly dissimilar.

THE commission appointed by Borough President Ahearn to enquire into the cause of the recent collapse, four or five weeks ago, of buildings in different parts of New York—twenty of these buildings, on eight separate sites, are included in the list—has made a very satisfactory sort of report. It declares the buildings were hastily and carelessly built, of poor materials and in defiance of the building code, and that the inspection given by the public officials was inefficient. This every one supposed was the case, and the report only makes plainer that the Bureau of Buildings through its inefficient inspection and tacit approval of what was being done is, so far as the public is concerned, the guilty party. But, as we have said before, even capable and conscientious inspectors could not do properly the amount of work that should be exacted,—but this does not mean that even half-competent inspectors should not have stopped the building operations on each of these structures long before the thaw which was, of course, the proximate cause of the collapses. In its report the commission makes some excellent suggestions. We believe that in the report on the Hotel Darlington accident, a year or so ago, it was urged that architects should not furnish drawings unless they were to be allowed to supervise the execution of the work. The present report puts the matter even more strongly for it recommends that "Architects be required by law to supervise the construction of buildings for which they furnish plans." That is a capital recommendation and will have the support of every capable man in the profession. Its enforcement would do more than any one thing to better the present unsatisfactory state of affairs, since it puts the responsibility squarely on the man who by education and training best knows what responsibility means, who knows what things are likely to go awry and how they should be prevented from so doing. But supervision does not mean superintendence and there is still need of intelligent foremen and competent and fearless public inspectors. Perceiving that it would not be fair to increase an architect's responsibility and yet leave the work the law would compel him to supervise at the mercy of incompetent workmen, the report further recommends that "all contractors for mason work or structure-steel work should be licensed," and that it should "be unlawful to permit the building of mason work or the erection of structural iron work by persons not licensed." These are the best and most important of the suggestions contained in the report.

MEANWHILE the Superintendent of Buildings, Mr Hopper, who does not seem to understand how seriously his own integrity is impugned by the various charges that have been brought against himself and his bureau, preserves an unseemly air of jauntiness which leads people to feel that he has but vague ideas of the reality of his responsibilities. He is preparing his official report on the collapsed buildings which possibly may disclose how it came about that the provisions of the Building Code were allowed to be disregarded—in other words, who got the money and who paid it. Mr. Hopper is also engaged in preparing his defense against charges formally presented against him by a manufacturer of floor flanges, who alleges favoritism and unlawful discrimination. He is also busy considering the peculiar nature of certain forms of concrete flooring which allow a too-confiding workman to drop successively through four of them, and, incidentally, he may be marvelling at the toughness of New York mechanics who can without great bodily injury be blown up through a river bed or fall down through concrete floor after concrete floor. In the intervals left by these personal occupations, Mr. Hopper has found time to condemn a large amount of so-called fireproofed wood that was about to be used for the interior finishing of the great Trinity Building.

A GOOD many Americans will be interested to learn that the Royal Academy has been pleased to honor Mr. Reginald Blomfield, as, several years ago, they honored his uncle, Sir Arthur, and has elected him an Associate. Mr. Blomfield, whose sketches and drawings are always artistic and satisfactory, has devoted himself mainly to domestic architecture, and has designed an unusually large number of important "country houses," as the term is understood in England. But we fancy that his claim to membership in the Academy rests in no small degree on his writings; at all events, he is probably best known in this country by his *"History of Renaissance Architecture in England,"* published in 1897, and by the work, *"The Formal Garden in England,"* published in 1900, and prepared in collaboration with Mr. F. Inigo Thomas.

AMERICAN ARCHITECTURE.

A Foreign Art With a National Future.

ARCHITECTURE in the Old World is a national development. When we hear a building referred to as French, Italian or Spanish we know instinctively what is meant. There are certain definite methods of design which are invariably embodied in each composition. When a structure is described as an excellent example of American architecture, all that we know is that it is excellent.

Architecture in America we have—American architecture is still in its infancy. It is an undisputed fact that, considered as one of the fine arts, our architecture possesses few national characteristics. Our transplanted civilization and our rapid economic development have alike been unfavorable to the growth of a representative art.

Nations tell the story of their evolution in their architectural monuments. Our nation was founded under heterogenous social and political influences, and our architecture is the echo of these conditions. Although the aborigines of North America had nothing to give, many nationalities brought their fully developed civilizations to the New World, thereby surfeiting us with precedent, no part of which was indigenous.

Having all this precedent and but few years for the sifting process, the practice of building as an art did not keep pace with our industrial progress, as this very progress keeps the modern American architect so engrossed with more imperative duties inconsistent with artistic accomplishment that he has neglected to devote his time and thought to the creation of an American ideal. Ultimately, however, a national architecture will be created as the result of the industrial changes inseparable therefrom.

These changes are already making the architect's present position in the arts untenable. They will in turn relieve him of many of the duties which are now considered an essential part of an architectural practice. In the scientific and mechanical branches of the work under the architect's control close attention to these duties has developed distinctively American characteristics. Similar devotion to design should cause his art to become equally national.

Architecture has always responded to the needs of civilization. The works which we recognize as types of their periods were in their day its most successful responses; successful mechanically, structurally and, above all, artistically. They were creations of an age when the architect was thoroughly equipped for his task; when he devoted time, thought and concentrated energy to his work. He evolved his design with local materials, by the use of local methods, to meet a local demand. The result was local.

Architecture was most vital where the conditions were most exacting. In the days when Italy was torn into political fragments each city developed an architectural type unlike its neighbor. The style of the Florentines marked as distinct an epoch in the history of art as the work of the Hindoos. The Florentine architect was the natural heir to the Classic traditions of his soil; but he too was conscious of foreign influences. Romanesque and Saracenic art formed part of his heritage. Unlike his modern prototype, however, he did not create his designs by adopting any of these styles in its entirety and fitting each to his requirements in its turn. With these types as a basis he created still another, and original artistic progress kept pace with social development. Like the successful modern architect, he combined the talents of an engineer with his genius as an artist; but the conditions under which he lived and worked allowed him to give the proper amount of effort to both branches of his art.

The architect of the Renaissance had but one or two commissions under his charge at one and the same time. He lived with his work; each detail had his individual attention. Time was a secondary consideration. The craftsmen that he required were usually found in his own town. The trades with which he dealt were few. It was possible for the architect to proclaim himself an expert in all the crafts essential to the execution of his design He was indeed the master builder.

Architecture in America had, on the other hand, no indigenous basic principles. Each group of settlers in what afterwards became the thirteen colonies brought to our shores the traditions of its native land. Except in the case of the English, wherever one nationality was left in undisturbed possession for an extended period it left its stamp upon its buildings. Even Holland, whose occupancy was short, bequeathed the high stoop to the modern dweller in what was once New Amsterdam, and the prevailing type of old Dutch farmhouse can still be seen dotting the valley of the Hackensack. Spain through its monks and soldiers left its indelible mark in Florida and California, and on the Pacific Slope, where the occupancy of Spanish-speaking races extended over three centuries, its influence is still felt, and is a potent factor in modern design. The French came nearer to evolving a distinct American type than any other race of settlers, and the neo-Spanish dwelling of the old City of New Orleans, with its many-storied balconies, is a unique example of adaptability to environment rarely found in Frenchmen; but as this type was distinctly tropical, it was unsuited by its very nature to become national. It is naturally from Englishmen, whose sovereignty finally extended over the entire thirteen colonies, that our architecture drew most of its early inspiration. The English settler represented two distinct types—Puritan and Cavalier. To the Puritan, devotion to an æsthetic ideal was almost ungodly; to the Cavalier, fashion was the law. The Puritan built purely as a protection from the elements. The Cavalier imported his architecture, as he imported all other refinements. When the civilization of the colonies reached the point where its buildings could be considered from standpoints other than that of simple utilitarianism, the Georges were on the throne of Great Britain. In England, the truly national styles created in the Gothic period and in the days of Queen Elizabeth were on the decline. The influence of Sir Christopher Wren and his followers was supreme. The prevailing type of English work was Italian, or, as it came to be known, Georgian. It was distinctly un-English, but it was the fashion. This fashion was imported, and much good work was done in the Colonies in this temporary mode, creating the type that we now know as "Colonial," which to-day, in the absence of any more characteristic development, is mistakenly considered American.

During the early part of the nineteenth century the architecture of the United States was still an echo of the mother country's. We still continued to follow the British fashion, as we responded first to the Classic revival, with all its dreariness and unsuitableness, and then to the Gothic movement of Victoria's reign, so insistently fostered by Ruskin and his followers, and so clumsily imitated on this side of the ocean by untrained and uneducated men. During these years the art of architecture in the United States reached a state of degradation seldom equalled in a civilized nation.

With the era of business prosperity following the Civil War and culminating in the Centennial Exposition, there came an awakening—artistic and industrial. Stimulated by the tremendous business energy of the nation, new problems were presented to the architect for solution, problems peculiar to American civilization, for which there were no precedents.

Richard M. Hunt and H. H. Richardson had become potent factors in American architecture. They had come under the influence of the French Schools. In the days when most of our architects had graduated from the carpenter's bench, these two men were trained designers. For the first time the United States possessed a few educated men properly equipped to grapple with peculiarly national problems. Hunt led along purely academic lines; but Richardson seemed to discard his scholastic training and evolved a modern type based upon the Romanesque of the south of France. Under his facile hand it grew in character and vitality, until our architecture was completely dominated by one man. Romanesque became the fashion, and American architects were so used to following the latest mode that the country was soon dotted with hundreds of examples of Richardsonian Romanesque of varying degrees of purity. For a short time the type seemed almost national, if not indigenous. It was at least the first American fashion.

Since that time we have had many other modes, each taken up with the season. Coincident with the Exposition of 1876 and the rise of Richardson, the Jacobean type of structure associated with the reign of Queen Anne had its brief day of popularity; but this peculiarly feminine development was soon found to be thoroughly unsuitable to American requirements except when applied to works of the smallest type.

The next influence to proclaim itself emanated from the schools. Beginning with the Institute of Technology in Boston, institutions in which the study of architecture formed part of the curricula increased in the United States, and academic training promptly asserted itself in enthusiasm for the Renaissance of Italy, particularly of the Florentine type. Our architects slavishly copied the work of the Italians of the fifteenth and sixteenth centuries, and some of our best known men began their successful careers at this time by basing their reputations upon creditable but exact copies of these masterpieces of Italian art.

The influence of training along these academic lines soon

caused Americans to turn towards the fountain-head of architectural education and, for a number of years, more and more American students have been found in the ateliers of the École des Beaux-Arts in Paris. With their return came the French vogue—not the French of France, but the French of the schools—and, to-day, to be in the fashion, your design must be French.

The graduates of the Beaux-Arts have made a positive impression upon the American work of the last ten years. As alumni of one school they are closely banded together, and by a carefully prepared propaganda, carried on with great insistence through established schools and private studios, they are making a most serious attempt to manufacture artificially, out of foreign ingredients, a national style. They have succeeded in making the French type the prevailing fashion; but already a still newer mode dawns upon the horizon. Owing to the influence of progressive Germany, and particularly to its excellent exhibit at the Louisiana Purchase Exposition, the signs of the times point to still another change, and throughout the Middle West the influence of the "Secession" is already making itself felt.

The "Secession" is the modern protest against precedent created in a nation where historic style has been the all-pervading influence in industrial design. Its introduction into the United States is too recent to have had a very positive effect at this time; but it should be particularly applicable to a new country where its followers need not face the difficulties which have hampered its originators, who were bound by the tyranny of one national type.

As each of these fashions arose in turn most of our architects accepted them just as they are given in the text-books. With rare exceptions, each designer has chosen a recognized style as a prerequisite to the study of his problem; and in many conspicuous cases he has gone even farther and selected a particular building, which after careful dissection he has adapted to his more modern conditions. Under these circumstances a national architecture has been an impossibility.

For the first time in our history we have a body of men educated for a special purpose, who have as a class failed to keep abreast of our national development in one of the main departments of the work for which they have been trained. This failure is not due to want of ability. Far from it. Most of the architects of the newer generation are virile and cultured men. But virility and culture can accomplish nothing without concentrated effort; and under the pressure of our modern industrial system this effort has been diverted to other and more urgent channels.

This being a materialistic age, the vast majority of our buildings of the character that make for architectural development are erected for purely commercial reasons. Every advance in science and mechanics is eagerly seized upon. Radical changes in the building-arts have complicated modern construction to such an extent that no one man can grasp their intricacies and honestly proclaim himself an expert. The changes which the business methods of the building-trades are undergoing are equally radical. This is an age of feverish business haste. As a nation we pride ourselves upon the promptness with which we accomplish results. Economic success in building-operations is generally dependent upon rapidity of construction. Both owner and contractor show an increasing tendency to act through corporate interests. The mechanic, the laborer and, frequently, the contractor can be dealt with only through their organizations, through which the building-industries are utilizing and developing the forces of co-operation to the fullest extent.

In the midst of this feverish haste the architect is supposed to be an authority in all the varied services necessary for the construction of a huge modern work within the minimum limit of time. A busy architect may have a dozen such structures under way coincidently. In order to vitalize his claim to perform mechanical and scientific service in an expert capacity, he attempts to keep abreast of the times by acting as civil engineer, sanitary expert, heating and ventilating specialist, professional electrician, and so continuing through the whole gamut of endeavor necessary for the solution of his complicated constructive problems. In some instances he employs professional assistance; but even then he attempts to supervise the work of the experts with the utmost exactness, notwithstanding the fact that each branch is in itself a study to which other men devote their entire careers.

The architect's claim as an authority in economics is based solely upon the exigencies of his employment. The client demands exact and careful supervision of financial interests as being paramount to all other considerations. His work must be constructed at the minimum cost and produce the maximum income. This duty is imperative. It cannot be delegated to employés, as is the case with many of the more strictly architectural functions of his practice. To hold his clientèle the architect gives the best of his time and thought to the business of answering this demand. He involuntarily bends his energies to this end and makes himself thoroughly familiar with the latest and most improved methods of construction, in order that he may be able to erect his building with the utmost dispatch. High taxes and one year's loss of rentals may mean financial disaster to his client, and hence to himself.

During the few moments that he has to spare from these exacting duties, he occasionally attempts to design, or at least to make the roughest sort of a sketch, which is turned over to a draughtsman for further elucidation. More frequently the sketch itself is the work of the draughtsman, over whom the architect exercises purely advisory supervision. When the design is finished the architect signs his name and assumes responsibility.

Under these conditions most of our architectural works are evolved by men whose lack of experience prevents effective acquaintance with existing sociological conditions, the intimate knowledge of which is essential to the creation of a national type. Generally these draughtsmen have received careful training in the schools. Historic style is the main resource. Mistaking transient modes for permanent motives, they are compelled to achieve results with such haste that careful study is impossible, and even for those who desire to be original the text-book becomes the only sure and safe guide.

When the draughtsman has obtained the necessary experience to make him a competent designer, he, too, becomes an architect and, if successful, must in turn leave his designing to subordinates. These young men, fresh from the schools, the real sponsors of most American work of to-day, are apt to be orthodox in their tastes. Their education prescribes exact rules of procedure. In the beginning of their careers, which is the only period when they actually design, they have not yet learned that their school training was simply a preparation of the designing faculty for the actual problems of an architectural practice. Under the influence of this system much American design has become judicious copying, and it is commendable in exact proportion to the judiciousness with which the copying is accomplished.

What of the future? What has architecture to offer in the development of our national art? Its ranks are being recruited from the best types of our young men, whose education in the technical schools, both at home and abroad, is equal to any that the world affords. Many of our active practitioners are men of broad view and great ability. There are two conspicuous examples of American architects who have devoted time and concentrated energy to their designs, whose work shows strong personal and wholly original characteristics. It has devolved upon a Chicago and a Philadelphia practitioner to demonstrate the ability of American designers to meet modern conditions untrammeled by precedent. The Westerner's solution of the steel-frame building is as modern and national as the building itself. It plainly indicates its structure. It makes no pretense to being supported by masonry. Its glittering expanse of windows laughs at precedent, and proclaims a new and light structural material. The Philadelphian's treatment of the more humble problems of domestic architecture is equally original, for although he shows perfect familiarity with historic style he has chosen and combined according to his own untrammeled taste. He sees no lack of harmony between Gothic mouldings and Renaissance ornament, and the results have justified his convictions. The whole profession has contributed to the solution of the small American suburban residence, and the modest frame dwelling is one triumph of national architecture, in which all of the workers may claim a share. There were no precedents to hamper the designer. There were no historic motives in the material used. There were no complicated methods of construction, such as are involved in the larger works. The problem was purely architectural, and its solution appealed to that large middle class, which is itself so characteristically American. The result has proved satisfactory, whether considered from an economical, mechanical, artistic or national point of view. It is the one bit of purely American architecture evolved under conditions compelling and permitting original artistic thought.

Thus in this isolated field, where the American architect has expended time and energy, he has produced national types, and in the realm of science and mechanics, where economic necessities have compelled constructive inventiveness, he is also thorough and original. How can the American architect be allowed to devote equal energy and to obtain equal results in the broader art of design which in its ultimate aim is the quality which distinguishes him from the engineer?

In England, where the same conditions obtain to some extent, a small band of men is attempting to solve the question by making it a rule to accept only a limited number of commissions in each year; agreeing with each client to devote personal attention to his work, with the understanding that the fee be increased above the usual amount.

In the United States the solution is being forced by our corporate interests. This is an age of specialized and co-operative effort. Modern industry is subdividing its energies to the utmost. It puts definite metes and bounds to every man's labors, and exacts of each only the work for which he is best equipped.

The greater portion of our large architectural works are no longer promoted by private patrons. Corporations large and small are now in control. Their activities functionize the powers of the owner as well as the contractor, and frequently appear in both capacities. At the head of each of these enterprises is an expert in executive management. He knows to a nicety just what he requires of each unit under his control, and realizes their limitations with exactness. He knows that as business counsellors his financiers excel. He appreciates fully that his mechanical experts are far more competent to advise in heating, in electricity and in engineering problems than his architect. But he knows further that no one is as competent as his architect to design and to assemble his multifarious technical forces. He needs the architect as a supervisor purely in an advisory capacity. He therefore insists that the architect should simply design and assemble the constructive parts, and he places the burden of the details of business, of mechanics and of science with those best fitted to render the maximum amount of expert service.

This is the system of the large corporations whose activities are becoming such a revolutionary force in the building-trades.

Their programme is being imitated by the small corporation especially formed in order to finance one building, an arrangement so frequent that in our large centers of population the private owner is almost eliminated. The system is bound to reduce the power of the architect as a business force; but when he is shorn of many of those duties which now consume all of his working hours, he will again have leisure to devote his abilities to his specialty. Thus the disease is its own cure, and the economic evolution which has forced the architect into a position alien to his art will in time restore him to his proper place. He will then be able to create, to construct, and above all he will again design. With the enormous energy and undoubted ability which is our national endowment, who can doubt that under these conditions the American architect will produce new types truly national artistically as well as constructively, and not copies of the forms and methods of older lands.

CHARLES H. ISRAELS.

HEATING AND VENTILATION.—V.

INDIRECT HOT-WATER HEATING.

THE radiators for indirect hot-water heating are of the same general form as those used for steam. The deep-pin radiators rated at 15 square feet of heating-surface per section are well adapted to hot-water heating. Figure 23 shows a good

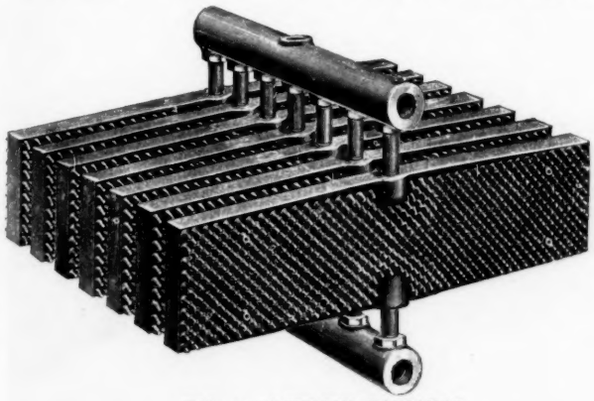

FIG. 23.—DEEP-PIN RADIATOR.

form for water circulation and also of good depth, which is a necessary point in the design of hot-water radiators. They should not be less than 12 or 15 inches to give good results.

The sizes of indirect heaters for water may be computed in the same manner as for steam; that is, first determine the required surface for direct heating and multiply the result by 1.5 for pin-radiators of good depth. For other forms the factor should vary from 1.5 to 2, depending upon the depth and proportion of free area for air flow between the sections.

The casings around the stacks, the sizes of flues and registers, may be determined in the same manner as for steam.

Regulation of temperature in the rooms may be obtained by varying the temperature of the water in the boiler, by mixing-dampers, or by a combination of the two. Another method is to make up the stacks in two banks of shallow radiators, instead of one bank of deep radiator, and connect the upper bank with an automatic control system which shuts it off or turns it on as required. This will be mentioned more fully under the head of automatic control. In indirect hot-water work it is not desirable to supply more than 80 to 100 square feet of radiation from a single connection. When the requirements call for larger stacks they should be divided into two or more groups according to the size.

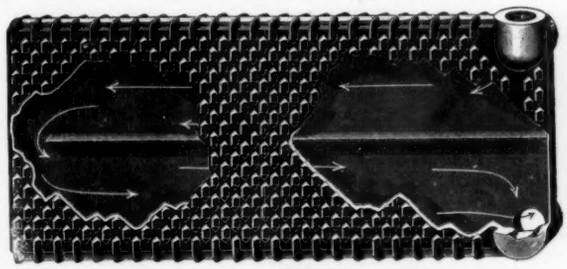

FIG. 23a.

The supply-mains should rise from the boiler to a point near the basement ceiling, then branch and slope downward with a pitch of about an inch in 10 feet to points over the stacks, then drop and make connection at such points as the special form of radiator requires. The tops of the main risers from the boiler should be vented through half-inch pipes, the same being connected and carried to the expansion-tank, where connection may be made either with the expansion-pipe or the vent from the tank. As most of the air is liberated from the water in the process of heating up in the boiler, it will be carried off at once by the vent-pipes before it has a chance to pass into the supply branches and stacks.

Air in a heating system always tends to rise to the highest point, and as the supply-pipes are graded upward from the stacks to the tops of the risers over the boiler, the air in the entire system works toward these points and is carried off through the vent-pipes, before mentioned. As an additional precaution, ⅜ inch vents may be taken off from the supply-pipes just before they drop to the stacks. These vents should be brought down to points easily reached from the basement floor and provided with pet-cocks. The returns should be taken from the bottom of the stacks and carried at a lower level back to the boiler. Conditions may make it necessary to bring back several separate returns to the boiler, but it is considered better to use one or two large flow mains and the same number of returns, where it can be conveniently done.

As the difference in elevation between stacks and boiler is necessarily small, the pipes should be of ample size to offset the slow velocity of flow through them. The following sizes for runs up to 100 feet will be found ample for ordinary conditions. Some engineers make a practice of using somewhat smaller pipes, but the larger sizes will in general be found more satisfactory, although for short runs the pipes may be made a size smaller if desired.

Size of pipe.	Square feet of radiation.	Size of pipe.	Square feet of radiation.
1	15	3	300
1¼	30	3½	400
1½	50	4	600
2	100	5	1,000
2½	200		

SCHOOL-HOUSES.

Thus far we have only considered the *warming* of buildings, no special provision having been made for *ventilation*. In furnace and indirect steam and water heating, a certain amount of fresh air is required for carrying the heat to the rooms, but the problem is considered from the side of heat-supply rather than air-supply. In the case of school-houses the matter of ventilation takes equal rank with that of heating, and the two must be treated separately. Before taking up the different systems of supplying air for ventilation, let us consider briefly the composition of the atmosphere and the method of determin-

ing the required amount necessary for maintaining certain standards of purity within a room.

It is a well known fact that atmospheric air is not a simple substance but a mechanical mixture. Oxygen and nitrogen, the principal constituents, are present in very nearly the proportion of 1 part of oxygen to 4 parts of nitrogen by weight. Carbonic-acid gas, the product of all combustion, exists in the proportion of 3 to 5 parts in 10,000 in the open country. Water in the form of vapor varies greatly with the temperature, and the exposure of the air to open bodies of water. In addition to the above, there are generally present, in variable but exceedingly small quantities, ammonia, sulphuretted hydrogen, sulphuric, sulphurous, nitric and nitrous acids, floating organic and inorganic matter and local impurities. Air also contains ozone, which is a particularly active form of oxygen, and lately a new constituent called argon has been discovered.

Oxygen is the most important element of the air, so far as both heating and ventilation are concerned. It is the active element in the chemical process of combustion, and also of a somewhat similar process which takes place in the respiration of human beings. Taken into the lungs it acts upon the excess of carbon in the blood, and possibly upon other ingredients, forming chemical compounds which are thrown off in the act of respiration or breathing.

The principal bulk of the atmosphere is nitrogen, which exists uniformly diffused with oxygen and carbonic-acid gas. This element is practically inert in all processes of combustion or respiration. It is not affected in composition, either by passing through a furnace during combustion or through the lungs in the process of respiration. Its action is to render the oxygen less active and to absorb some part of the heat produced by the process of oxidation.

Carbonic-acid gas is of itself only a neutral constituent of the atmosphere, like nitrogen, and, contrary to the general impression, its presence, in moderately large quantities (if uncombined with other substances) is neither disagreeable nor especially harmful. Its presence, however, in the air provided for respiration decreases the readiness with which the carbon of the blood unites with the oxygen of the air, and therefore, when present in sufficient quantity, may cause indirectly, not only serious, but fatal results. The real harmfulness of a vitiated atmosphere lies in its other constituent gases and the minute organisms which are produced in the process of respiration. It is known, however, that these other impurities exist in a fixed proportion to the amount of carbonic acid present in an atmosphere vitiated by respiration. Therefore, as the relative proportion of carbonic acid may be easily determined by experiment, the fixing of a standard limit of the amount in which it may be allowed also limits the amounts of other impurities which are found in combination with it.

When carbonic acid is present in excess of 10 parts in 10,000 parts of air, a feeling of weariness and "stuffiness," generally accompanied by a headache, will be experienced; while with even 8 parts in 10,000, a room would be considered "close." For general considerations of ventilation the limit should be placed at 6 to 7 parts in 10,000, thus allowing an increase of 2 to 3 parts over the proportion present in outdoor air, which may be considered to contain 4 parts in 10,000 under ordinary conditions.

The amount of air required to maintain the standard of purity can be very easily determined, provided we know the amount of carbonic acid given off in the process of respiration. It has been found by experiment that the average production of carbonic acid by an adult at rest is about .6 of a cubic foot per hour. If we assume the proportion of this gas as 4 parts in 10,000 of the external air, and allow 6 parts in 10,000 in an occupied room, the gain will be 2 parts in 10,000, or, in other words, there will be $\frac{2}{10,000} = .0002$ of a cubic foot of carbonic acid mixed with each cubic foot of fresh air entering the room. Therefore, if one person gives off .6 of a cubic foot of carbonic acid per hour, it will require $.6 \div .0002 = 3,000$ cubic feet of air per hour per person to keep the air in the room at the standard of purity assumed, that is, 6 parts of carbonic acid in 10,000 of air.

It is customary in good practice to provide for 50 cubic feet per pupil per minute in grammar and high schools, and 30 cubic feet in primary schools. The latter figure is called for by law in Massachusetts.

Air is moved for ventilating purposes in two ways: first, by expansion due to heating; and second, by mechanical means. The effect of heat on the air is to increase its volume, and therefore lessen its density or weight, so that it tends to rise and is replaced by the colder air from above. The available force for moving air obtained in this way is very small, and is quite likely to be overcome by winds or external causes. It will be found in general that the heat used for producing velocity in this manner, when transformed into work in the steam engine, is greatly in excess of that required to produce the same effect by the use of a fan. Ventilation by mechanical means is performed either by

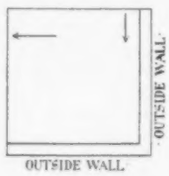

FIG. 24.

FIG. 25.

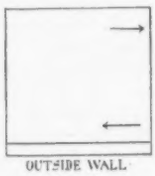

FIG. 26.

pressure or suction. The former is used for delivering fresh air into a building and the latter for removing the foul air from it. By both processes the air is moved without change in temperature, and the force for moving it must be sufficient to overcome the effects of wind or changes in the outside temperature. Some form of fan is used for this purpose.

In the case of school-rooms where large volumes of air at moderate temperatures are provided, it is best to admit it through openings in the wall at a height of 7 or 8 feet from the floor. This gives a more even distribution, as the warmer air tends to rise, and hence spreads uniformly under the ceiling; it then gradually displaces other air without sensible currents or draughts. The cooler air sinks to the bottom of the room and can be taken off through ventilating or discharge openings placed near the floor. The relative positions of the inlet and outlet are often governed to some extent by the building construction, but if possible they should be located in the same side of the room. Figures 24, 25 and 26 show common arrangements. The vent outlet should always, if possible, be placed in an inside wall, else it will become chilled, and the air flow through it will become sluggish.

The heat loss by ventilation may be found as follows: One B.T.U. will raise the temperature of 1 cubic foot of air 55° at average temperatures, or it will raise 55 cubic feet 1°, so that the heat required for the ventilation of any room may be found by multiplying the cubic feet of air supplied per hour by the number of degrees it is to be raised, and dividing the result by 55. *Example:* What quantity of heat will be required to warm 100,000 cubic feet of air to 70° for ventilating purposes, when the outside temperature is 10° below zero?

$$100,000 \times 80 \div 55 = 145,454 \text{ B.T.U.}$$

There are five systems, or combinations of systems, commonly used for the warming and ventilation of school-houses, as follows: Furnaces, indirect gravity, indirect gravity combined with direct radiation in the rooms; fan system with supplementary heaters at base of flues, and the fan system with direct radiation in the rooms.

Furnace Heating.—For school buildings of small size, the furnace system is simple, convenient and generally effective. Its use is confined as a general rule to buildings having from 2 to 4 rooms, although furnaces are sometimes used for 8-room buildings. One furnace is not commonly made to warm more than two class-rooms, as the warm-air pipes connecting the furnace with the flues must be short, to obtain the best results.

Like all systems which depend upon natural circulation, the supply and removal of air is considerably affected by changes in the outside temperature and by winds. The furnaces used for school-house warming are usually built of cast-iron, this material being durable, and easily made to present large and effective heating-surfaces. To adapt the larger sizes of house-heating furnaces to schools, a much larger space must be provided between the body and casing, to permit a sufficient volume of air to pass to the rooms. The free area of the passage should be sufficient to allow a velocity of about 400 feet per minute.

The size of furnace is based upon the heat lost by conduction through walls and windows plus that required for ventilation. With more regular and skilful attendance, it is safe to assume a higher rate of combustion in school-house furnaces than in those used for warming dwelling-houses. Allowing a maximum combustion of 6 pounds of coal per hour per square foot of grate, and assuming that 8,000 B.T.U. per pound of coal are taken up by the air passing over the furnace, we have $6 \times 8,000 = 48,000$ B.T.U. furnished per hour per square foot of grate. Therefore if we divide the total B.T.U. required for both warming and

ventilation by 48,000, it will give us the necessary grate-area in square feet. It has been found in practice that a furnace with a fire-pot 32 inches in diameter, and having ample heating-surface, will heat two 50-pupil rooms in zero weather.

The velocity of the warm air within the uptake flues depends upon their height and the difference in temperature between the warm air within the flues and the cold air outside. The action of the wind also affects the velocity of air flow.

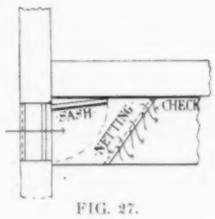

FIG. 27.

It has been found by experience that flues having sectional areas of about 6 square feet for first-floor rooms, 5 for the second-floor, and 4½ for the third, will be of ample size for standard class-rooms seating from 40 to 50 pupils in primary and grammar schools. These sizes may be used for both furnace and indirect gravity steam heating.

In mild, damp weather the air-supply will fall somewhat below the standard desired; but if the flues are made much larger they will furnish more air than can be heated in cold and windy weather. The cold-air supply duct may be made ¾ the size of all the warm-air flues, if free from bends, or the full size, if obstructed in any way. Each furnace should, if possible, receive air from two sides of the building, preferably the north and south or the northwest and southeast. Each duct should be of sufficient size to supply the full amount of air required, and should be provided with an air-check similar to that shown in Figure 27. To make the system more complete, mixing-dampers may be placed in the warm-air flues.

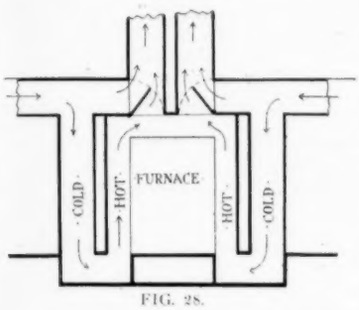

FIG. 28.

A typical arrangement of furnace, air-ways and dampers is shown in diagram in Figure 28.

The vent-flues may be made 5 square feet for the first floor and 6 from the second and third. They may be arranged in banks and carried through the roof in the form of large chimneys, or may be carried to the attic space and there gathered by means of galvanized-iron ducts connecting with roof vents of wood or copper construction. The former arrangement, however, is to be preferred, when it can be provided for. All roof vents should extend well above the ridge of the building in order to prevent down draughts caused by the air currents striking the roof and being deflected into the flues. Flues starting above the basement should in general be covered with a hood of some form to keep the snow and rain from falling into them. Where a hood is used, the free opening under it should be made twice the area of the flue. This is done because in case of winds the entire discharge from the flue is in one direction and must pass through only two of the external side openings under the hood. Roof vents starting at the attic floor, or above, should be provided at the bottom with water-tight pans of copper or galvanized-iron, with suitable drains, to prevent rain or melting snow from reaching the ceilings below. All vent-flues through the roof should be provided with dampers for closing when school is not in session. In order to make the vent-flues "draw" sufficiently in mild or heavy weather, it is necessary to provide some means for warming the air within them to a temperature somewhat above that of the rooms with which they connect. This may be done by placing a small stove, made especially for this purpose, at the base of each flue. If this is done it is necessary to carry the air down and connect with the flue just below the stove.

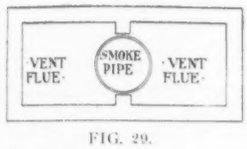

FIG. 29.

A much better method, and one equally effective, is to use a wrought-iron chimney-stack for the furnace and carry it up between the two vent-flues, as shown in section in Figure 29. If a separate furnace is used for each two rooms this arrangement may be used in each case. The inlet and outlet openings from the rooms into the flues are commonly provided with grilles of iron wire, having a mesh of 2 to 2½ inches. Both flat and square wire are used for this purpose, the weight of wire depending upon the size of opening. For ordinary work, 5/16 inch flat wire or ⅛ to 3/16 inch square wire may be used, set in light channel-iron frames. In the best class of work, flanges are riveted to the channels and the grilles screwed to wood grounds or frames. Shut-off dampers should be placed in all cold-air inlets, and doors opening from the basement into the cold-air box should be provided for use at night or when the school is not in session.

ILLUSTRATIONS

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This plate is copied from *Architektonische Rundschau.*

Additional Illustrations In the International Edition.

VIEW FROM THE SOUTHEAST: ROGERS MEMORIAL CHURCH, FAIRHAVEN, MASS. MR. CHARLES BRIGHAM, ARCHITECT, BOSTON, MASS.

NOTES AND CLIPPINGS.

A Reinforced Concrete Warehouse.—A brick and reinforced concrete warehouse has been built in Toronto, Ont., for Brown Bros. at practically the same figure as for slow-burning mill construction. The building is 192 ft. by 42 ft. in plan, with stories 10 ft., 15 ft., 14 ft. 6 in., 13 ft. 6 in., and 13 ft. 6 in. high from basement up. The floors are designed to carry 300 lbs. per square foot, and the columns are on 16 ft. by 12 ft. centers. The columns are reinforced by steel rods at the corners, with a wrapping of expanded metal like the hoops of other systems of construction. The columns are connected by concrete girders reinforced with six rods near their bottom surface, some of these rods being bent upwards at the ends. Instead of stirrups or loops, the girders have sheets of expanded metal at their ends. The floor-beams are of similar construction, but smaller.—*Building News.*

The Fatal Electric Sapping of Niagara Falls.—The special correspondent, F. C., of the New York *Evening Post* adduces the following proof to show how nearly destructive of the great Falls would be the enactment of the bill now before the State Legislature allowing a certain power company to use so much of the water in Niagara River as would "generate continuously 400,000 effective electrical horsepower at a head of 150 feet." To generate this power it would be necessary to send through the turbines, consequently abstracting it from the present flow over the brink of the Falls, 36,080 cubic feet per second. Now Dr. John M. Clarke, State geologist, declares on the authority of "a competent hydraulic engineer" that when the flow is reduced by 40,000 cubic feet "the water will be down to rock bottom," and then "the American Falls, though still forming a cataract, will be but a ghost of their ancient magnificence. Let one-fifth more of the water be abstracted beyond the line we have already calculated, and the American channel will be dry. That is, in effect, double the amount of 40,000 cubic feet, and when 80,000 cubic feet have been taken away from the present flow the Canadian channel will still be an interesting object, but the American Falls will be wholly gone."

The destruction of the Falls is designed, not through direct "harnessing" of the Falls themselves, but through drawing off and diverting the waters from the river above the cataract. As long ago as 1885 this design was put into partial execution, when the Legislature began giving away, free, franchises to power companies. Nine companies have been equally recognized, or chartered in New York. Five or six of these still exist, but only two are operating. These are the Niagara Falls Hydraulic Power

and Manufacturing Company, and the Niagara Falls Power Company. They are permitted to abstract water from the Falls supply as follows:

	Cubic feet per second.
N. F. H. P. & Mfg. Co.	7,700
N. F. P. Co.	8,600
Total	16,300

Three Canadian companies on the Canadian side, all active, have statutory limitations as follows:

	Cubic feet per second.
Canadian Niagara Power Co.	8,900
Toronto and Niagara Power Co.	11,200
Ontario Power Co.	12,000
Total	32,100

Thus for the five operating companies on both sides of the Falls, the amount they have been granted the right to consume is 48,400 cubic feet per second.

United States Government engineers have reckoned the average flow at 224,000 cubic feet per second; and Dr. Clarke observes in a paper in the *Popular Science Monthly*, that "Goat Island, picketing the frontier, divides the water unfairly, giving much more than three-fourths of their volume to the Canadian side, so that abstractions of water will make themselves first perceptible in the shoaling of the American channel."

Reduce that flow to 184,000 cubic feet per second and the American channel bed will be barely covered with water; reduce it to 144,000 and no water at all will be flowing over the American Falls. The two active American and three Canadian companies when using all they have been given title to will reduce the flow to less than 184,000. Let the Lockport company cut in and seize 36,080 cubic feet more per second, and there will be left only a flow of 147,920 cubic feet per second—and you can walk dry-shod upon the crest of dolomite limestone over which now passes that sublime rush of water which constitutes one of the beautiful wonders of the natural world.

Plumbers' Union Must Pay.—Judge Ellis, sitting in the District Court at New Orleans, La., on March 17 ordered the Plumbers' Union to restore Stephen Schneider and Edward Shekeler to membership and to pay them $1,000 each, with interest, for expelling them some months ago. Schneider and Shekeler were union plumbers and members of the State Board of Examination of Plumbers. They were ordered by the union to vote in the Board for a certain candidate for inspector, but declined to do so, exercising their individual preference and declaring that the union could not control their votes as members of a State Board. For this they were expelled and blacklisted. The verdict for damages is against the union itself and against all its officials and its individual members. The defendants were further enjoined from interfering with Schneider and Shekeler in their business and from discouraging and interfering with any person working with them or employing them, whether by threats or force or otherwise.—*The Metal Worker.*

Afghanistan as a Sea Power.—The jibes that are often bandied about concerning the prowess of the Swiss navy are taken in good part by the peaceful mountaineers, but similar fleers may not be swallowed as easily by the fierce subjects of the Ameer of Afghanistan, who is just now seeking a means by which he can secure a seaport connected with his own capital by rail.

Ventilating Sewers through House Soil-pipes.—The subject of sewer ventilation comes more closely to the attention of municipal engineers than the plumbers. Still, when the house trap is dispensed with, it becomes a part of the plumber's work. Charles R. Felton, city engineer of Brockton, Mass., says that the omission of the trap at the wall of the house is not enough of a novelty to cause any shock to sanitarians to-day. In Brockton there is no trap at the wall of any building connected to the sewer. This system has been in use for 11 years, and, while it may have no particular signficance, it is interesting to state that the death rate in that city for the last census year, and also for the last year, as reported by the State Board of Health, was the lowest of 23 cities in Massachusetts, having a population of over 25,000. The recommendation to adopt this system was made in 1893, and the engineer has never yet heard any complaints as to its practical working.—*The Metal Worker.*

The Condition of St. Mark's.—The scaffolding necessary for the restoration and strengthening of St. Mark's at Venice is now completed, and the engineers, Signori Manfredi and Marangoni, are busy directing the work. The condition of the cathedral, now that it has been possible to examine it closely, is found to be graver than appeared from the report of the two engineers, the weakest point being the Paradise and Apocalypse vaults. Though every care will be taken to maintain the vaults as they originally were, some part of them will have to be demolished and rebuilt; but it is impossible to say now in what proportion, as it is only in the process of demolition that the weaknesses will become fully apparent. The examination of the interior structure of the St. Alipio corner, which was excluded from the restorations made about the middle of the 19th century, has revealed an even graver state of things. The foundations of this corner have since then continued to sink, and the corner now stands independently from the rest with only one iron bar, put there in 1780, to keep it and the main body together. The corner will have to be demolished and reconstructed in order to strengthen the foundations. It will probably be necessary to remove and replace some of the ancient mosaics.—*Building News.*

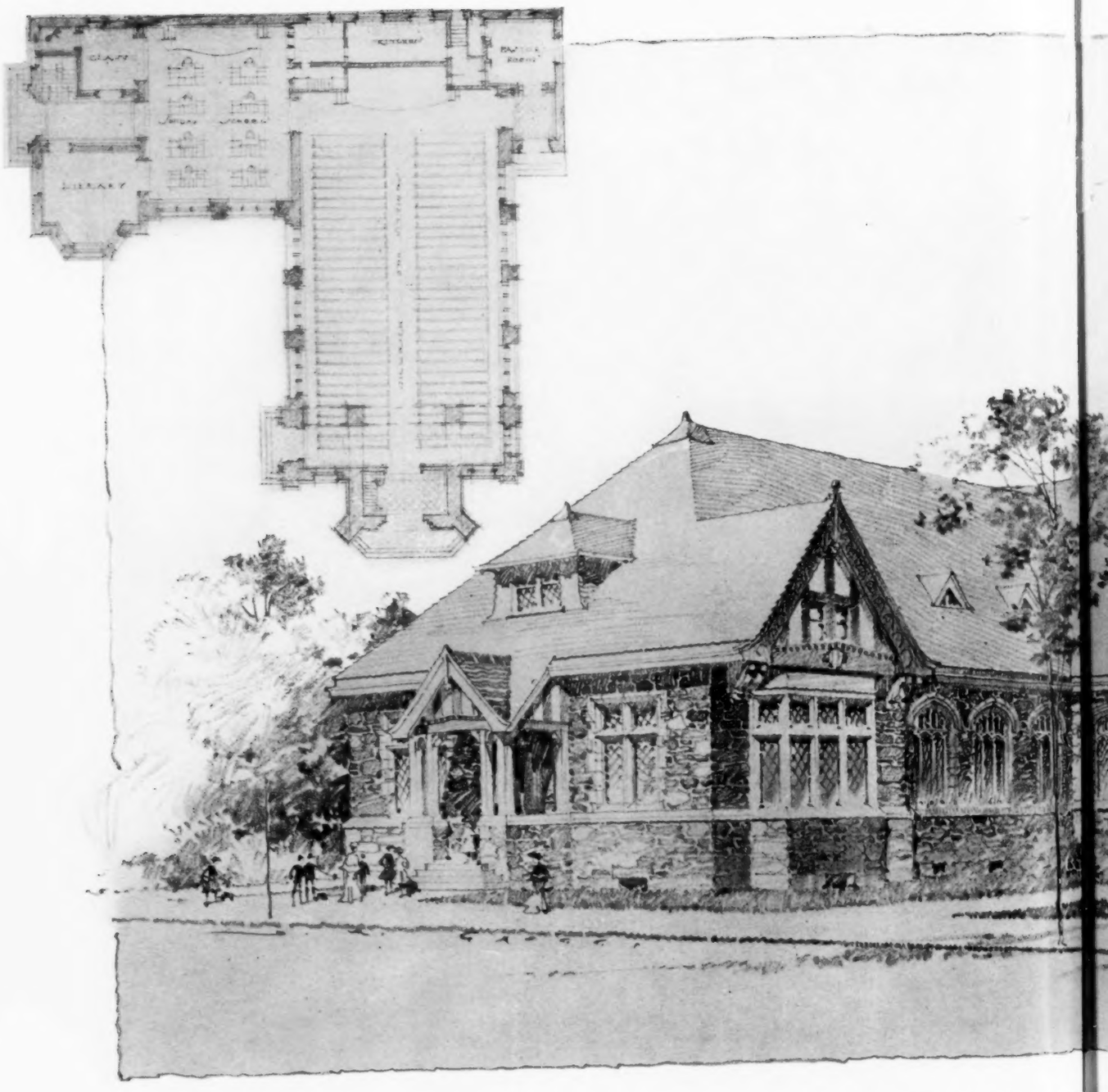
Prize Essay on Concrete-block Construction.—The publshers of *Engineering News* and the *Cement Age* are offering a first prize of $250 and a second prize of $100 for the best papers of from 5,000 to 10,000 words on "The Manufacture of Concrete Blocks and their Use in Building Constructions." The manuscripts, which must be anonymous, will first be examined by the editors of *"Engineering News"* and they will submit the five or more which they consider best to a jury consisting of Mr. R. W. Lesley, Mr. R. L. Humphrey and Prof. Edgar Marburg for final awards.

All manuscripts must be received not later than July 31, 1905, at the office of the Engineering News Publishing Co., 220 Broadway, New York. Full particulars may be obtained at that address.

Where Some of the First American Gold is.—The beautiful flat wooden roof (or rather ceiling) of Sta. Maria Maggiore, so elaborately carved and paneled from the designs of that graceful architect, Giuliano da Sangallo (1445-1516), is covered with a thick layer of the first gold brought from America by Columbus and sent in homage to Pope Alexander VI., a Spaniard, by Ferdinand and Isabella.—*New York Times.*

Kitchener's Spoils of War.—I understand that at Chatham there are now to be seen four colossal bronze figures of Boer worthies, which were brought back from the Transvaal at the time of the war. They are at present disposed about an open space in front of the arch that has been erected at the Royal Engineers' Institute as a Royal Engineers' war memorial, and in a recent letter to the local press the honorable Secretary of the Memorial Committee explained that they are the private property of Lord Kitchener, and are only in this position temporarily. A correspondent writing from Chatham asks how such articles can become the private property of an officer, and suggests that such things ought not to be treated as loot at all. If the Duke of Wellington had brought back from Paris in 1815 valuable public statues of Napoleon, Ney, and other French heroes, they would hardly, I take it, have been treated as his private property, nor, if the nation had assumed possession of them, would their exhibition in a public square in England be regarded as conducive to an "entente cordiale." We profess to be desirous of cultivating something of this kind with the vanquished Boers, and on that ground I should think the statues would be better placed in Pretoria than in England.—*London Truth.*

A Novelty in Swiss Hotels.—A unique hotel is being built in Switzerland. As far as its location is concerned it certainly will be the most exclusive hotel in the world. On the so-called Hammetschwand, on the Lake of the Four Cantons, there rises a solid rock to a height of about 2,395 feet. At a height of about 1,800 feet the rock forms a huge shelf or projection, and on the latter the hotel will be built. This projection has been pierced by a gallery, and a steel tower nearly 550 feet in height supports the rock projection, thus making the latter safe and secure. An elevator will take the guests and tourists up to this hotel, from the veranda of which one will enjoy one of the finest views in Switzerland. In other words, this hotel will practically be built on the top of an immense steel tower. The hotel will be completed in about four years.—*Boston Transcript.*



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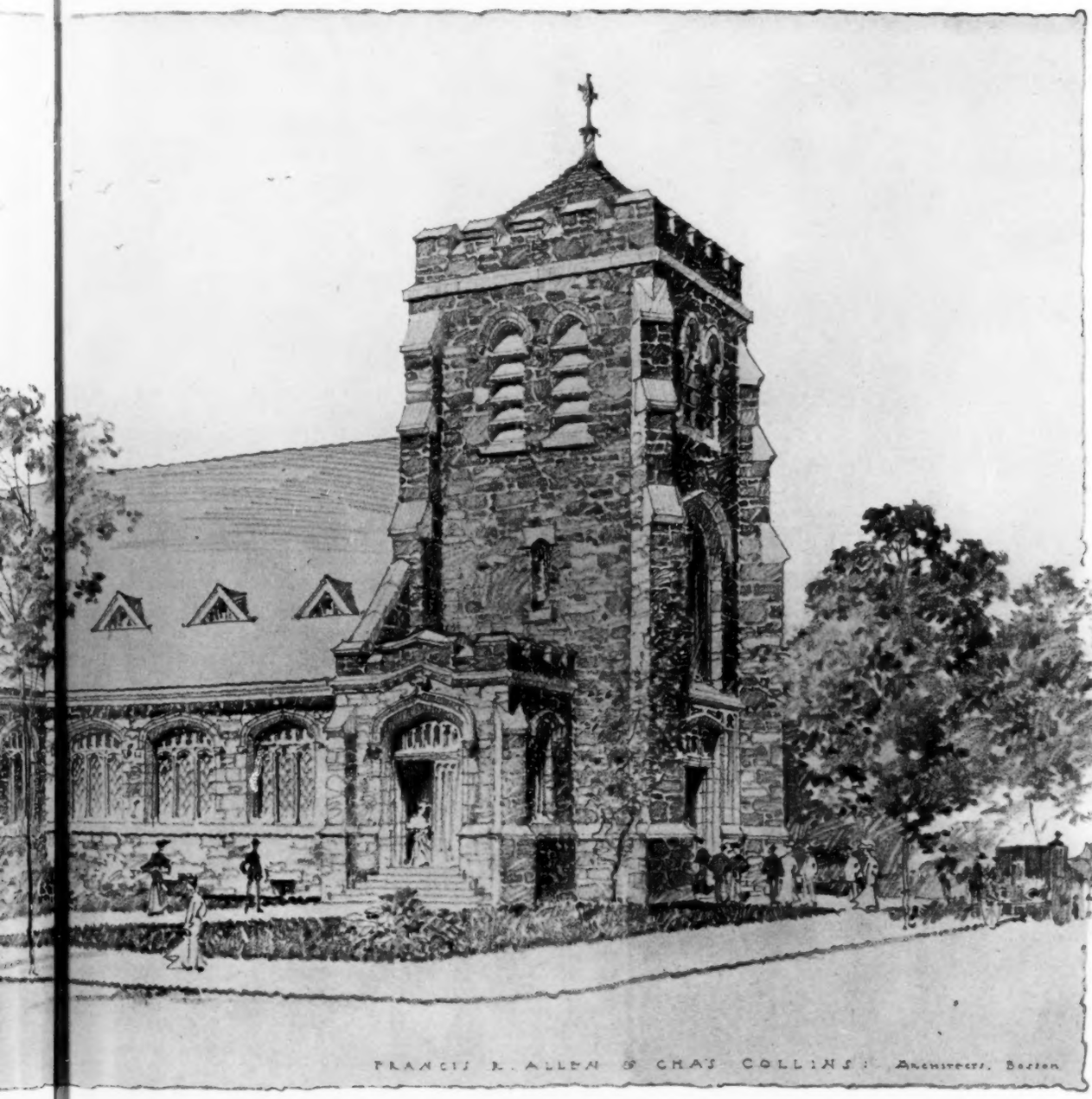

ED COUNTY CHURCH AND PARISH HOUSE.

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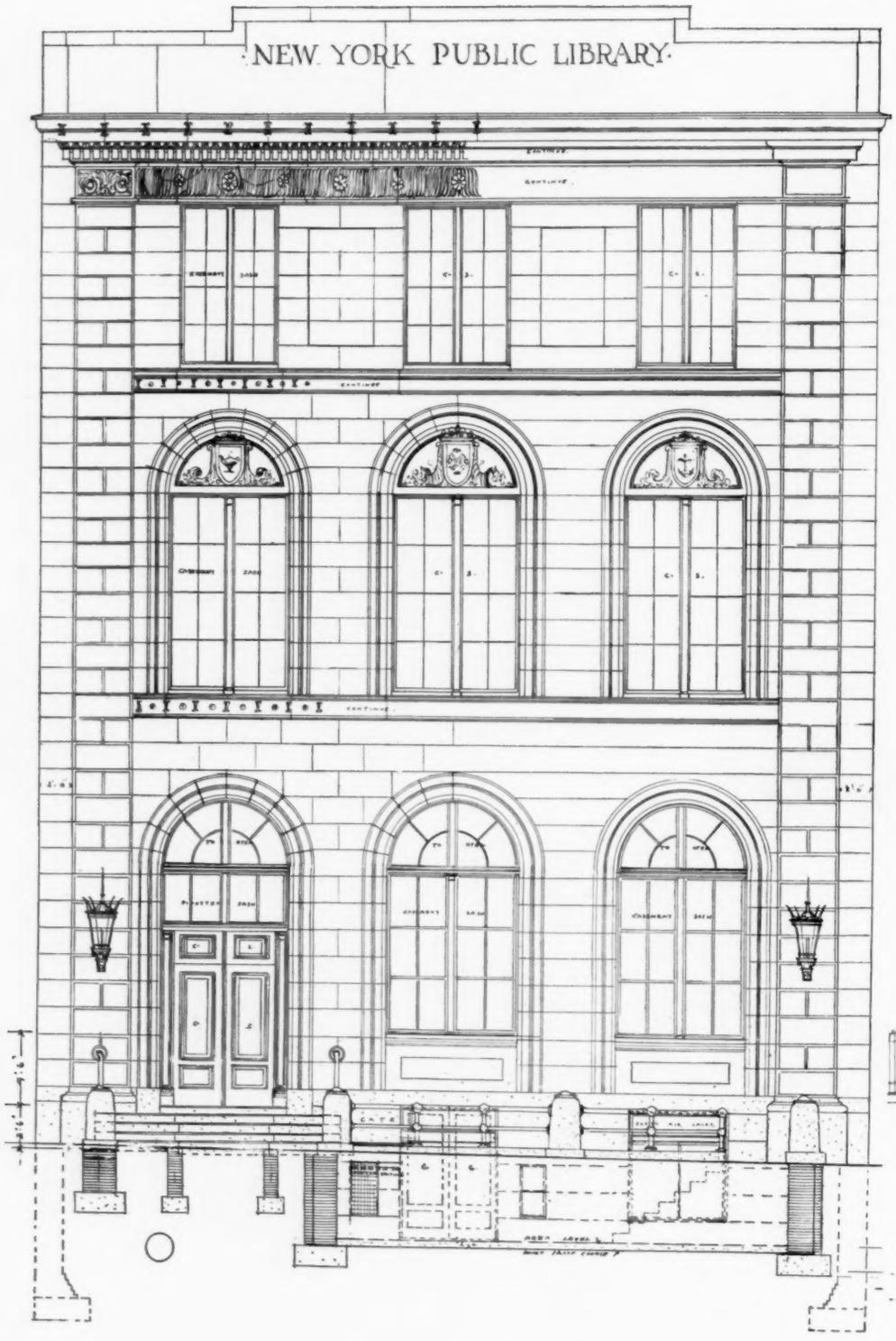

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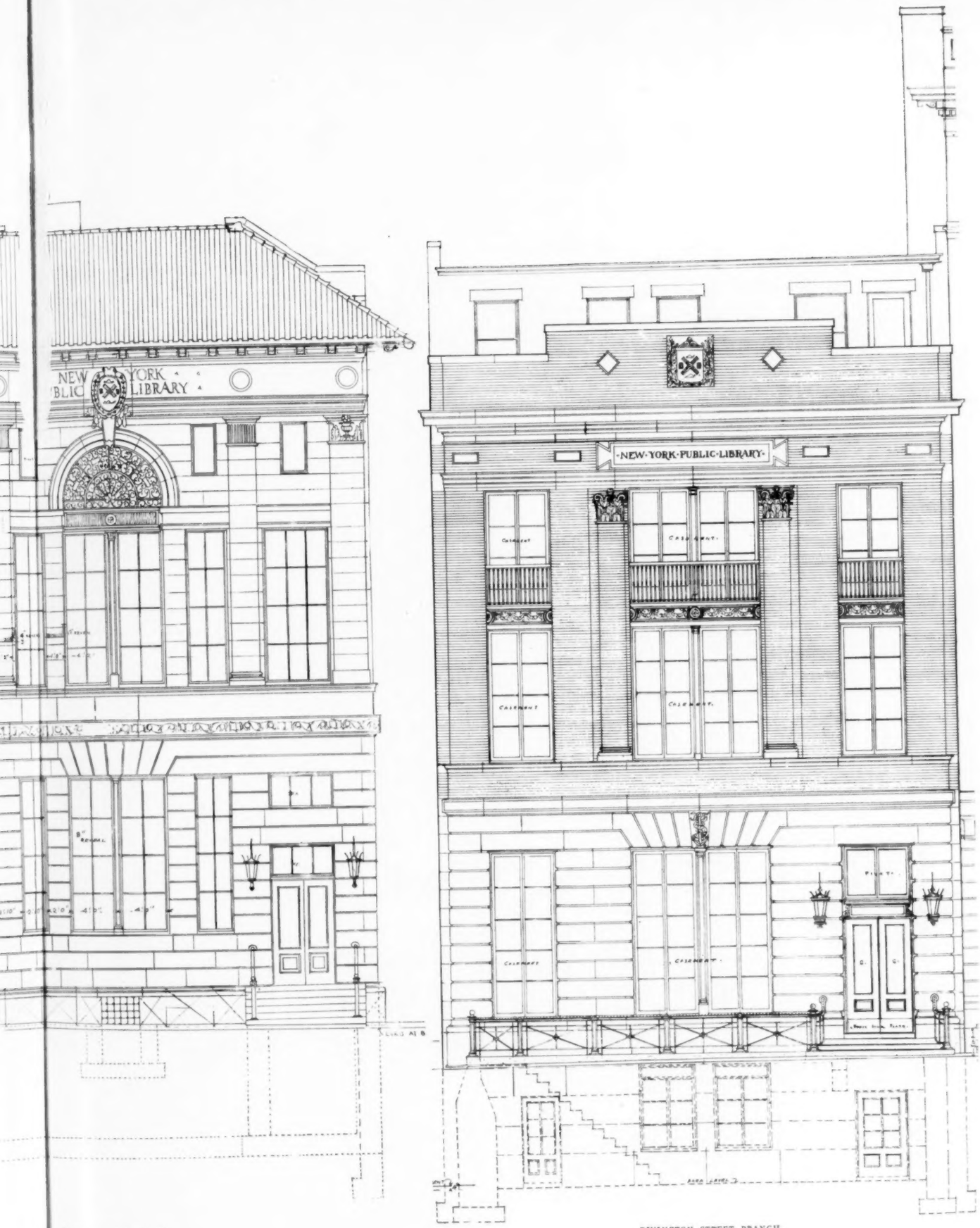

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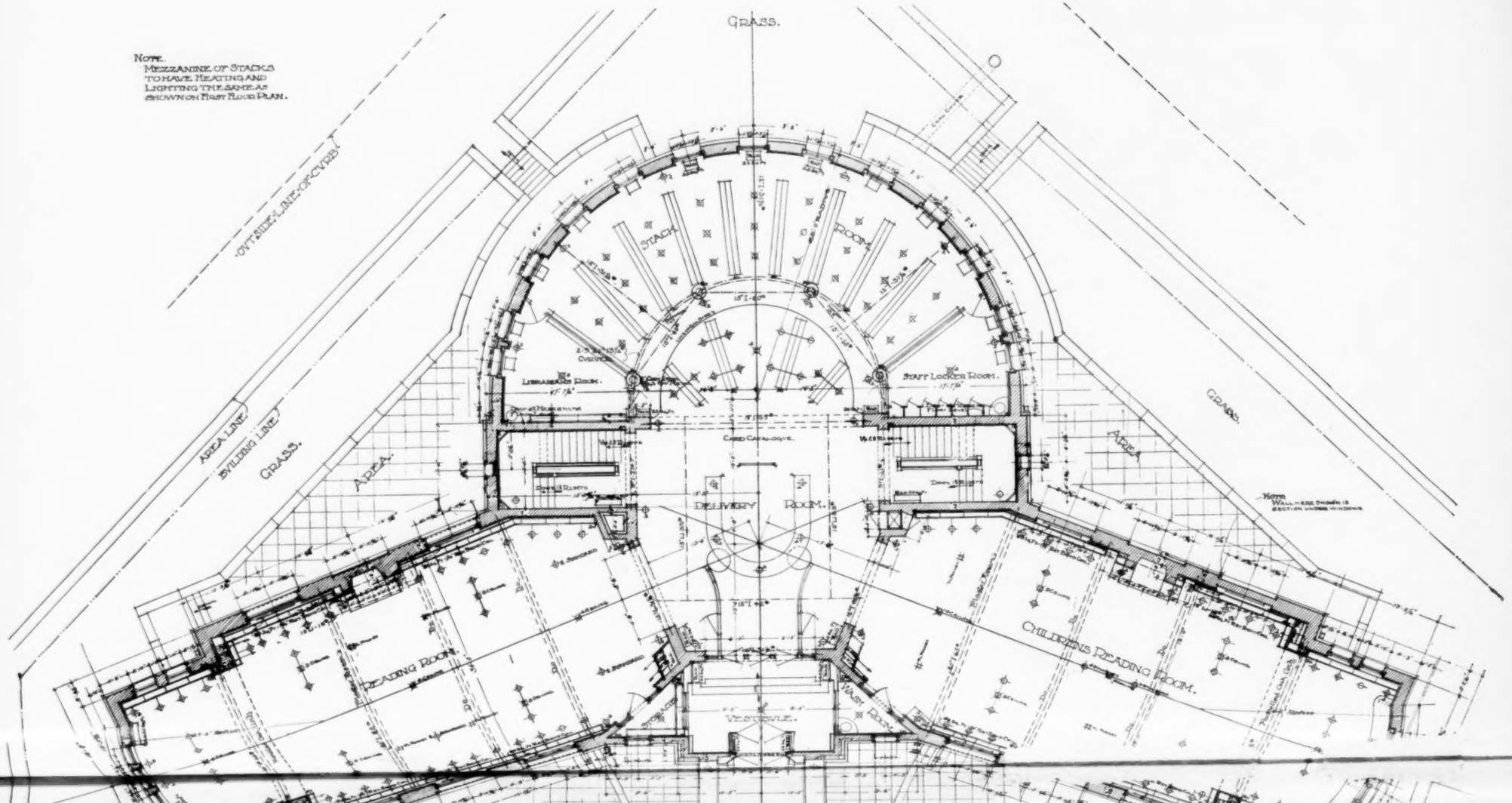
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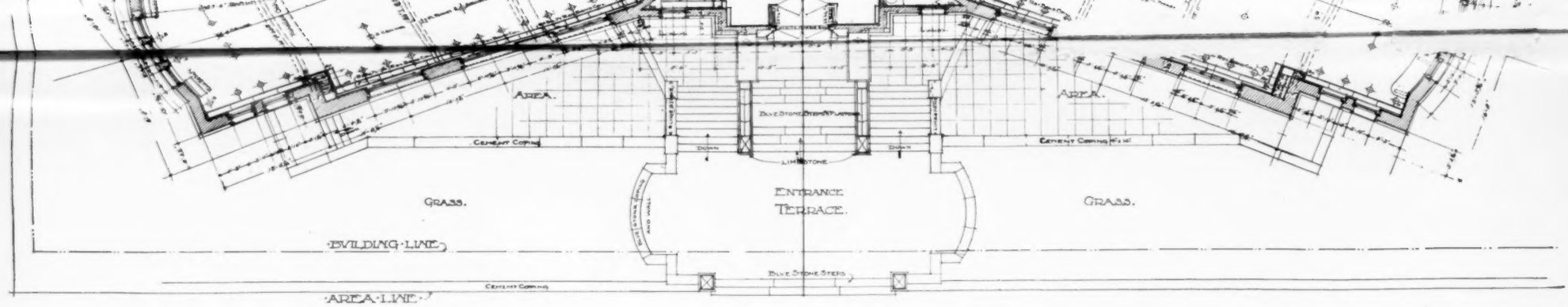

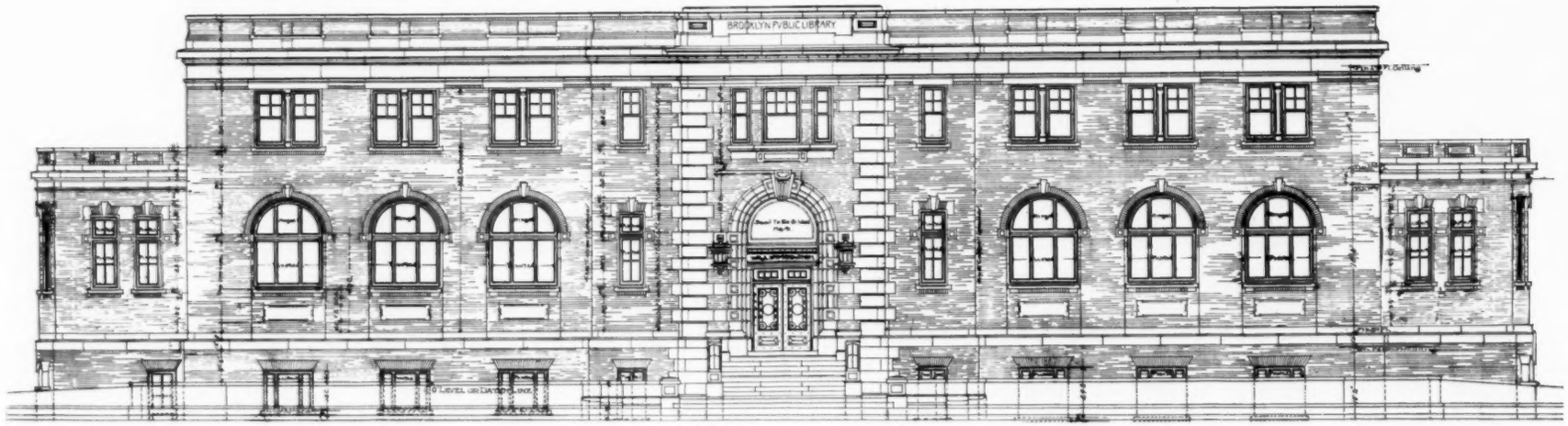

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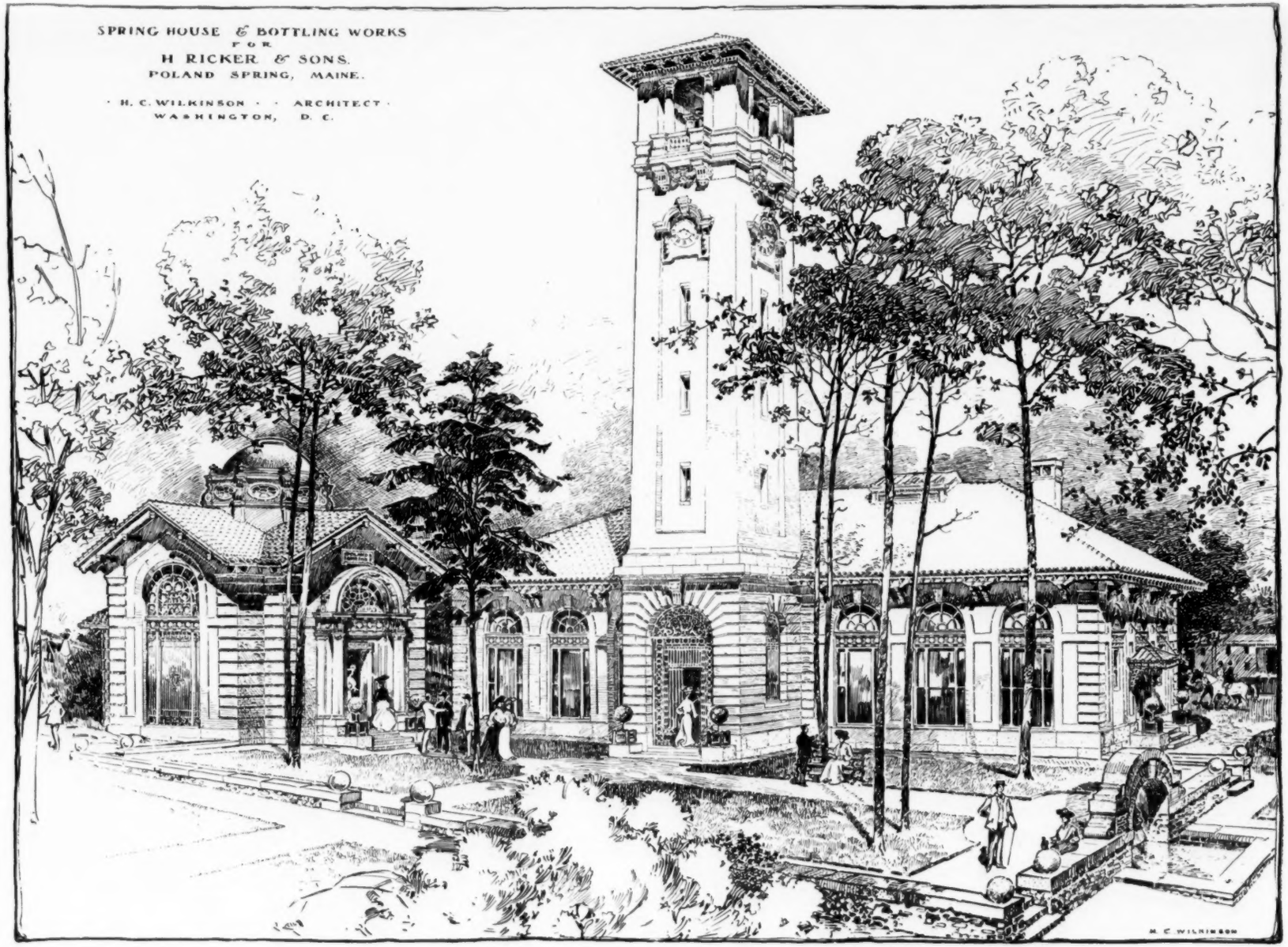

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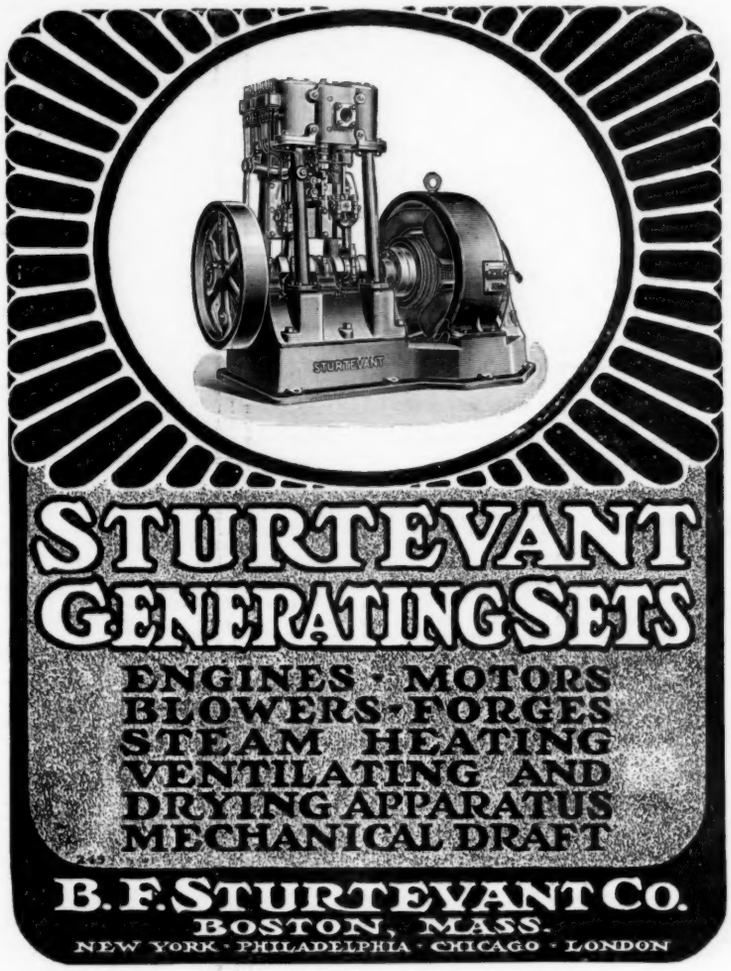

BUILDING NEWS.

Continued from page ix.

ing, Wheeling, W. Va. Same parties will take bids on 25,000 sq. ft. of metal ceiling. A cash deposit of 2½ per cent. is required on both contracts.

McKeesport, Pa.—John P. Harris, Pittsburgh, will build a theatre at McKeesport, 60 x 140 ft., 3 stories. Cost, $100,000.

Architects Dean and Stophlet, Fitzsimons building, Pittsburgh, has let the contract to E. D. Hoey for the Union National Bank building in 5th Ave., McKeesport; 3 stories, brick, brownstone front, bank fixtures, etc. Cost, $30,000.

Meadville, Pa.—Allegheny College will spend $50,000 on new buildings this summer. These include a preparatory school building, girls' gymnasium and an addition to Huling's Hall. Dr. W. H. Crawford is president.

New Brighton, Pa.—W. D. Beatty, Allegheny, Pa., has the contract for the passenger station at New Brighton for the Pittsburgh and Lake Erie Railroad. Brick and stone structure. Cost, $30,000.

New Britain, Conn.—It is reported that the South Congregational Society contemplates erection of a new church to cost over $500,000.

New Orleans, La.—Harry Watcham is reported to have organized a company for erection of a 10-story hotel to cost $750,000.

It is reported that Leopold Levy will erect a $50,000 residence on St. Charles St.

Niagara Falls, N. Y.—A 3-story stone gymnasium, costing $50,000, is to be erected at the Niagara University.

Nashville, Tenn.—Report states that J. B. McLemore has purchased a site from the Nashville Realty Co. and will erect a modern grain elevator and storage plant here on the line of the Nashville Terminal Co. Cost, $50,000.

Plans have been submitted to the Building Department for the new Methodist Publishing House, to be erected at 9th Ave. and Broad St. Cost, $100,000.

Geo. Moore & Sons have received the contract to erect a 3-story business building for J. H. Bruce, 70 x 170 ft. Cost, $60,000. Plans by J. H. Yeaman.

Norwich, N. Y.—Announcement is made of a gift of $50,000 by Andrew Carnegie to Norwich University for a library building, including the equipment of an electrical department.

Norwood, O.—Plans are under way at the office of B. S Baldwin & Co., Cincinnati, for a plant to be erected here for the Dana Co. The buildings will be 1-story, costing $125,000.

Norman, O. T.—F. O. Miller, County Clerk, Norman, will receive bids until April 20 for the erection of $40,000 courthouse and jail in accordance with plans and specifications on file in County Clerk's office.

New York, N. Y.—A residence, costing between $300,000 and $400,000, will be erected for Robert Graves, Esq., at 882 5th Ave. The material will be limestone. C. H. P. Gilbert, architect.

The old 6-story building at Nos. 31 and 33 Pine St. has recently been purchased for $750,000 by Henry S. Redmond. The site will be cleared and a handsome new office building erected for the banking house of Redmond & Co., now at 41 Wall St.

The Board of Estimate has voted to appropriate $120,000 to acquire a site for the new "Tenderloin" police station on W. 30th St.

McKim, Mead & White, architects, have filed plans for a residence, to be built for Mrs. William K. Vanderbilt, Jr., at 666 and 668 5th Ave., 50 feet south of 53d St. It will have façade of limestone, elaborately ornamented, and will cost in the neighborhood of $200,000.

Plans have been filed by C. A. Reed, the architect, for a temporary passenger station for the New York Central Railroad to be erected in the block bounded by Vanderbilt and Madison Aves., 43d and 44th Sts. The structure is to cost $200,000, and will be used while the new Grand Central Station is being erected on the old site. When the new station is ready for use the temporary building will be torn down.

Wm. K. Benedict, 11 E. 42d St., is taking bids on the general contract for 4-story brick parochial school, 100 x 75 ft., for the

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WANTED.—The address of an architect who wants a pupil. "BOX S.," Rutland, Vt. (1529)

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PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., April 3, 1905.—Sealed proposals will be received at this office until 3 o'clock P. M., on the 6th day of May, 1905, and then opened, for furnishing the heating apparatus complete in place, for the U. S. Post Office and Court House at Florence, S. C., in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Florence, S. C., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. (1528-1529)

Treasury Department, Office of the Supervising Architect, Washington, D. C., April 3, 1905.—Sealed proposals will be received at this office until 3 o'clock P. M., on the 10th day of May, 1905, and then opened for the elevator equipment for the U. S. Custom House, New York, N. Y., in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Architect, Cass Gilbert, 79 Wall Street, New York, N. Y., at the discretion of the Supervising Architect. Applications must be accompanied by a certified check for $150.00, which will be held at this office until the return of the drawings and specification. JAMES KNOX TAYLOR, Supervising Architect. (1528-1529)

Treasury Department, Office of the Supervising Architect, Washington D. C., March 29, 1905.—Sealed proposals will be received at this office until 3 o'clock P. M. on the 11th day of May, 1905, and then opened for the construction (except heating apparatus) of the U. S. Post Office at Laramie, Wyoming, in accordance with drawings and specification, copies of which may be had at this office or at the office of the Postmaster at Laramie, Wyoming, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. (1528-1529)

Treasury Department, Office of the Supervising Architect, Washington, D. C., March 30, 1905.—Sealed proposals will be received at this office until 3 o'clock P. M. on the 1st day of May, 1905, and then opened, for the construction, complete, of the U. S. Post Office at Jacksonville, Ill., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Postmaster at Jacksonville, Illinois, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. (1528-1529)

Treasury Department, Office of the Supervising Architect, Washington, D.C., April 10, 1905.—Sealed proposals will be received at this office until 3 o'clock P. M., on the 22d day of May, 1905, and then opened, for the construction, complete, of the U. S. Post Office at Oil City, Pennsylvania, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Postmaster at Oil City, Pa., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. (1529-1530)

Treasury Department, Office of the Supervising Architect, Washington, D. C., April 1, 1905.—Sealed proposals will be received at this office until 3 o'clock P. M. on the 29th day of April, 1905, and then opened, for the construction (except heating apparatus) of the U. S. Post Office at Flint, Michigan, in accordance with drawings and specifications, copies of which may be had at this office, or at the office of the Postmaster at Flint, Michigan, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. (1528-1529)

Veronicas Church Corporation, 657 Washington St. It will be erected at Washington and Barrow Sts. at an estimated cost of $90,000.

Plans have been filed by Ralph C. Gildersleeve, architect, 27 W. 30th St., for a 12-story addition to hotel at 14 E. 60th St., for Alpha Realty Co., 29 Broadway. Cost, $220,000.

In a report submitted to the Committee on Education of the Society of Columbia University Architects, Prof. A. D. F. Hamlin emphasizes the need of the university for a Fine Arts building.

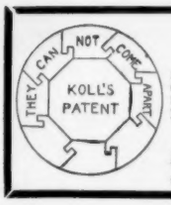
Luke A. Burke, 401 W. 59th St., has received the contract for 9-story addition, 25 x 180 ft., to New York Edison Co. Bldg., 55 Duane St. Thomas E. Murray, architect and engineer. Cost, $300,000.

Plans have been filed by Archt. L. A. Goldstone, 110 W. 34th St., for 15 4-story dwellings, 21 x 63 ft., at 18-41 W. 85th St., for J. Carlew Construction Co., 17 W. 122d St. Cost, $450,000.

NEW YORK, N. Y.—A press report states that within a very short time the Democrats of the Borough of Queens will have a permanent home in Long Island City. The site is on Anable Ave., rear of the Temple Court and facing the Courthouse plaza, and has been purchased from the N. Y. Land and Warehouse Co. Plans and specifications will at once be prepared and work will commence on the new building without delay.

We are informed that an art building, costing $2,000,000, is to be erected in the city, in which will be held annually an "international salon." It is reported that two wealthy citizens have pledged themselves to subscribe the greater part of the required amount.

In the annual supply bill reported by the Ways and Means Committee of the Assembly, an appropriation of $150,000 is made as half the cost of a reception hospital for the insane, to be built in New York City



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and to take the place of the insane pavilion of Bellevue Hospital.

It is reported that Milford, Mass., quarries have been awarded a contract to furnish the granite to be used in the construction of the new terminal station of the Pennsylvania Railroad Co. in New York. The contract price for the stone is $1,600,000, and it is said its production will require the employment of 1,200 men for two years.

Plans are under way at Columbia University for a new college hall and a law school building. The former will be erected on the southwest corner of Amsterdam Ave. and 116th St. Opposite this, on the north side of 116th St., will be the law building. They will both be imposing structures of stone and brick, following the general style of other buildings on the campus. Work on the college hall will probably be begun before the end of May. Work on the law school building may be deferred somewhat, through lack of funds, although it is hoped this may not be the case.

Plans have been filed for a pergola to be erected for the plant collection of George Sherman, at 3 W. 54th St. It will be 25 ft square, having an ornamental dome 30 ft high, and a lion head fountain. It is to be of brick lined with red sandstone and fitted with small latticed windows extending to the cornice of the dome. Estimated cost, $12,000.

We understand that a well-known firm of brewers have purchased for $27,000 a plot at the corner of Borden, Jackson and Vernon Aves. A large 3-story hotel, with all modern conveniences, will be erected on the site.

Omaha, Neb.—It is stated that bids will be asked for soon, for proposed new Catholic cathedral. It will cost $290,000. Plans by Thomas R. Kimball, McCague building.

Edward Rosewater and J. L. Blanders & Sons, will erect a 10-story hotel at 17th and Douglas Sts. Plans by John Latenser. Cost about $400,000.

Pawtucket, R. I.—A Catholic Church is to be erected at Narragansett, and work will be begun as soon as weather permits. The new structure will be placed on the corner of Rodman and Rockland Sts. and next to the old church. The edifice will be 107 ft. in length and 50 ft. in width, and will have seating capacity of 700.

Peekskill, N. Y.—It is reported that Archbishop Farley recently laid the cornerstone of the new $175,000 Guardian School building at Peekskill. The new building will be of the most modern plan. It will contain a hall for amusements, a bowling alley, roof garden, gymnasium, baths, basketball rooms and a shooting gallery.

Pensacola, Fla.—A large warehouse building will shortly occupy the lot where now the city pound is maintained. The building will be erected by the Lewis Bear Co. Work will be started at once.

Philadelphia, Pa.—It is announced that tenders for diphtheria and scarlet fever pavilions are to be invited soon. These will be erected on the Macalester farm tract in the 33d Ward. This site was acquired by the city for the new municipal hospitals. Plans have been drawn by Herbert W. Johnson, the official architect of the Departments of Public Safety and Works, and approved by Director Martin. They provide for buildings horseshoe in shape, 2 stories high, with basement. Each will accommodate about 300 patients. They will be built on a plan of units, so that the capacity of each can be extended by additions to treat 1,000 patients. The sum of $900,000 is available for the work. Contracts will be awarded the latter part of April. A nurses' house, gymnasium for the doctors and nurses and a chapel are other buildings for which plans are being prepared.

Pittsburgh, Pa.—Morris Kaufmann, 5th Ave. and Smithfield St., proposes to build a Fulton Market at 1707-1719 5th Ave. Cost, $40,000.

Thomas A. Coleman, Penn Ave., East End, will build nine brick veneer houses. Cost, $45,000.

Architect H. D. Gilchrist, Frick building, has plans for a new building for the Western Theological Seminary. Cost, $350,000.

Architect S. W. McCluskey, 47th St., has plans for a store and apartment building for J. H. Lennon, at Lincoln and Frankstown Aves. Cost, $50,000.

John Goettman, Diamond St., J. A. Aull and George W. Martin will erect a 5-story brick store building on 60 x 145 ft. at 5809-5813 Penn Ave. Cost, $75,000.

The Third United Presbyterian Society, Diamond St., has decided to erect its new edifice in Northumberland St., Squirrel Hill. Cost, $100,000. No architect selected.

Architects Rieger and Currier, Ferguson building, have preliminary plans for a 19-story, steel construction building to arcade the present market-house site in Diamond square. The proposed building will contain 1,500 offices, a convention hall to seat 8,000 and tile-lined market stalls on the first and second floors. I. L. Currier, C. R. Buchheit and A. F. Emmons, Columbia National Bank building, are promoting the project. An ordinance will be introduced in City Council asking for a 99-year lease on the site.

Architect Charles Bickel, 524 Penn Ave., has let the contract to Charles Reif, Jr., for a bakery building for the Thomas R. Mackey Baking Co., at Forbes and Miltenberger Sts.; 6 stories, 104 x 120 ft. Cost, $75,000.

F. E. McGillick, Penn Ave., East End, will build 30 brick houses in Larimer Ave. Cost, $60,000.

St. Andrew's Protestant Episcopal Church will erect a building at Hampton and St. Clair Sts., East End. Cost, $75,000.

Architect W. A. Thomas, Park building, has let the contract to Kohn Siebert & Sons for three colonial houses for Thomas Evans, Negley Ave. Cost, $43,000.

A. & S. Wilson Co., 3d Ave. and Try St., have the contract for an addition to high school in Fulton St. Cost, $30,000.

Allen H. Machesney, St. Nicholas building, and others, propose to erect an office building in 4th Ave., near Wood St. Cost, $500,000. Competitive plans are being considered.

Architect R. E. Hampton, 1112 House building, is taking bids on counters, shelv-

Seats of the Colonists

PART I

This work is intended to supplement "The Georgian Period" and to treat of the furnishings which were used in the buildings described and illustrated in the latter.

The part now published treats mainly of Chippendale furniture. It contains an illustrated Glossary of Terms by W. S. Bigelow and an Introductory Chapter by Horace C. Dunham.

It has 28 plates, each 10x14 inches, showing photographic views and "MEASURED DRAWINGS" of the best existing examples. These last, by Mr. Dunham, constitute the main feature of the work.

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ing and plate glass show-cases for the Leader Department Store, Guskey building. Cost, $50,000.

George E. Schwan, 326 4th Ave., has plans for a city engine house at Northumberland St. and Shady Ave., Squirrel Hill. Cost, $40,000.

W. B. Bennett, care of Real Estate Corporation, Park building, has the contract for a 5-story brick and stone apartment building, 97 x 80 ft., in Butler St. Cost, $50,000.

It has been learned that the consideration in the purchase by St. Andrew's Protestant Episcopal Church congregation of the property at Hampton and St. Clair Sts. was $33,000, and that the seller was Charles R. Miller. The lot is 150 x 242 ft., and will be used for a church site.

It is reported that John Goettman, J. A. Aull and George W. Martin have purchased for $48,000 property situated at 5809-11-13 Penn Ave., East End. The property fronts 60 ft. on Penn Ave. and runs back 145 ft. to Kirkwood St. The ground is now vacant and will be improved by the purchasers with a $75,000 store building.

Fred R. Babcock, of the Babcock Lumber Co., has purchased property in Woodland Rd. for $50,000. It has a frontage of 342 ft. on Woodland Rd., with an average depth of 360 ft., and is located only a short distance from 5th Ave. The site, which is literally a private park in the heart of the city, will be improved at once with a $60,000 residence and stable to cost $10,000.

P. F. Maginn has purchased 41 x 131 ft. on the south side of Forbes St., near Chestnut St., for $20,000. The only improvements are several old dwellings of nominal value, and they will be torn down and replaced with a modern warehouse to cover the entire lot.

Pottsville, Pa.—Architect Alexander Forbes Smith, of Reading, has completed plans for the new office building of the Reading Coal and Iron Co., which is to be located at 2d and Mahantonga Sts. It will be 62 x 112 ft. in size and 4 stories in height. The basement will be of granite, and from the first floor up it will be of Indiana limestone, with terra cotta trimmings and gray brick. The structure will be fireproof throughout, with concrete floors and slag roof. There will be fireproof vaults, running from the basement to roof, opening on each floor.

Portsmouth, O.—Richards, McCarthy & Bulford, The Ruggery, Columbus, have drawn plans for a $100,000 edifice for Holy Redeemer Society.

Painesville, O.—George F. Hammond, 166 Euclid Ave., Cleveland, is preparing plans for the $75,000 courthouse and the $75,000 jail to be erected here by Lake County.

Pittsburgh, Pa.—A brick and steel factory building, 90x 600 ft., will be erected by the Kinnear Pressed Radiator Co., at West Pittsburgh. Capital stock of company, $400,000.

At a recent meeting of the University Club the matter of a clubhouse to be erected in the East End was discussed. It was practically decided to carry the project through.

H. Dodson Gilchrist, Frick Bldg., has submitted plans to Board of Trustees of the Western Theological Seminary for new buildings for that institution. Estimated cost, $350,000.

Pensacola, Fla.—It is reported that the Palafox Street Methodist Church is having plans prepared for the erection of a $60,000 edifice.

Quincy, Ill.—It has been voted to expend $80,000 for the construction of two elementary school-houses and $40,000 for an addition to the high school building.

Rhinelander, Wis.—It is reported that the city contemplates erecting a $50,000 high school this Summer.

Roseville, O.—The Kenton Fiscal Court at Covington has decided on the purchase of 47 acres, near Roseville, for infirmary purposes. The Building Committee consists of Justices Jameson, Durain and Connelly, Treasurer Metcalf and County Attorney Tracey. Plans and work will be rushed.

Richmond, Va.—The Cable Co. of Chicago will purchase site and erect an 8-story building, containing an auditorium, studios and warerooms.

Rivermont, Va.—The school board has adopted plans by Lewis & Burnham, of Lynchburg, Va., for the erection of a $25,000 school building.

Rochester, N. Y.—It is reported that the brick and stone convent to be built in connection with the Church of the Immaculate Conception will be erected on property purchased in Gregory St. from Mrs. Electa Blair. The site has a frontage of 105½ ft. in Gregory St. and is 160 ft. in depth.

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St. Louis, Mo.—Ground has been purchased and plans are being drawn for the erection of another immense shoe factory for the Peters Shoe Co., adjoining the present factory No. 4. The new plant will be 5 stories in height, 55 ft. in width and 265 ft. in length.

Seattle, Wash.—A building permit has been taken out for the new Catholic Cathedral, to be erected at 9th Ave. and Columbia St. The building contract will be let at once.

Sioux City, Iowa.—The new manufacturing plant about to be erected by the Simmons Hardware Co. will cost at least $300,000, and the contract for erection on a cost plus fixed sum basis has been awarded to Mr. Frank B. Gilbreth, of New York, by the architects, Messrs. Gordon, Tracey & Swartwout, of 156 5th Ave., New York City. It has been practically decided to construct the interior of this building, columns, floors, etc., of reinforced concrete.

Among other large work now on hand in Sioux City are the new shops for the Chicago & Northwestern R. R., and it is reported on good authority that two or three of the packing houses have decided to erect very large branches here.

The First Presbyterian Church congregation has decided to build a $50,000 edifice this coming summer.

Somerville, N. J.—Work of construction will soon begin on the mansion to be erected near this town for James B. Duke, head of the tobacco trust. The cost is estimated at about $1,000,000.

Sewickley, Pa.—Architects Rutan and Russell, First National Bank building, Pittsburgh, are taking bids on a brick and stone residence for Robert G. Book. Cost, $45,000.

St. Louis, Mo.—Report states that Steve Collins, of Rock Island, Ill., has received the contract to erect the $150,000 storehouse and office building in this city for Deere & Co., of Moline, Ill.

We learn that the Advance Realty Co. has been incorporated with a capital of $1,000,000, for the purpose of erecting a business building at Olive St. and Broadway. Thos. O. J. McCawley is interested.

Farrar & Tate, Wainwright building, have prepared plans for a 15-story building, which it is proposed erecting at 14th St. and Washington Ave., at an approximate cost of $1,000,000.

It is reported that the McNichols Furniture Co. (Henry J. Nichols, president), will erect an 8-story building at 1020 Market St. Cost, $200,000.

Sharpsburg, Pa.—Architect S. A. Hall, House Building, Pittsburgh, is taking bids for a 16-room school house building at Sharpsburg. Cost, $60,000.

San Francisco, Cal.—The Washington Grammar School, for which bids for the construction are soon to be received by the Board of Public Works, is to cost about $119,000.

St. Joseph, Mo.—The Masons are said to be contemplating the erection of a $100,000 temple.

St. Paul, Minn.—It is stated that O. Peterson has introduced a bill in the House of Representatives providing for an appropriation of $320,000 for construction of new buildings, at State Agricultural College.

Daniel E. Waid and E. L. Masqueray, 156 Fifth Ave., New York, N. Y., have been commissioned to prepare plans for proposed $1,000,000 Cathedral of St. Paul.

Salt Lake City, Utah.—A press report states that the Utah Realty Co. has awarded the contract to erect the Herald building on S. Main St. to McDonald & Son, at $90,000.

Springfield, O.—It is reported that General Manager C. E. Schaff and Ch. Engineer George Kittridge, of the Cleveland, Cincinnati, Chicago & St. Louis Ry. system, have submitted plans to Mayor C. J. Bowlus and City Engineer W. H. Sieverling for the new passenger and freight station, to cost $300,000. Construction will begin soon.

Steilacoom, Wash.—Bids will soon be received by Proctor & Farrell, Tacoma, for two additions to the insane asylum here. Cost, $100,000.

Saugus, Mass.—It is reported that the town of Saugus may build a $100,000 high school. Charles E. Stevens, Supt. Schools.

Thornburg, Pa.—Frank Thornburg, Diamond National Bank building, is taking bids on 6 cottages of different designs, to be built at Thornburg. Cost, $50,000.

Terre Haute, Ind.—A movement is on foot, headed by Prof. Parsons and the faculty of the State Normal School, to have a separate building erected for the library. The new structure, as outlined, would be fireproof and erected just east of the school. The Normal Library contains 40,000 volumes.

Talladega, Ala.—It is reported that the Board of Directors of the Alabama Synodical College will erect, next Fall, a new building for administrative purposes to cost $50,000. Rev. G. W. Patterson, Montgomery, Chairman of the Board.

Toledo, O.—The Toledo Commonwealth Company, a recently organized company, has purchased a lot at the corner of Jefferson and Superior Sts., and will erect a $100,000 mercantile building. Harry E. King, care King & Tracy, Nasby building, is the leading spirit in the concern.

Plans for the new Rachael Ann Hotel, to be erected by George H. Ketcham, Valentine building, have been entirely changed. A contract has been signed by Horton and Bennett, well known hotel proprietors in Canton and Dayton, O., whereby they be-

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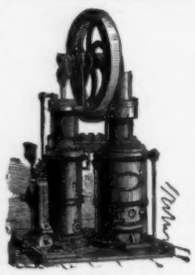

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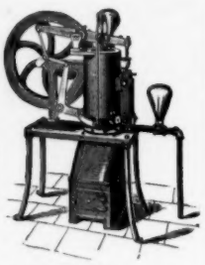

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come the lessees of the new building when finished. The owner is now in the East, looking over modern hotels, and upon his return, arrangements will be made to have plans drawn for a $200,000 addition to the Valentine building, which is to be partially used for the new building.

The Toledo-Massillon Bridge Company has been formed and will erect a $100,000 bridge plant in Toledo. C. A. Peckham, care Bissell Electrical Company, is secretary of the company. The concern has already purchased the Massillon Bridge Company's plant and has options on several local sites. The plant is to be completed this Summer. Plans have not yet been drawn.

Victoria, B. C.—Work has just started on the superstructure of the new tourist hotel for the Canadian Pacific Railway Co. The total expenditure will amount to over $1,000,000, the contract for superstructure alone being $500,000.
during the recent holiday recess, three Degr

Watertown, N. Y.—Work is soon to be commenced on the construction of the Sacred Heart Church at the corner of Lynde and Thompson Sts. The structure will be Gothic in design and will be constructed of the best quality of repressed brick and trimmed with Indiana limestone. Cost, $80,000. Architect, D. D. Kieff.

Waukesha, Ill.—Architects Leenhouts & Guthrie have completed plans for the new $25,000 school building to be erected here. It will be two stories, of brick, with stone trimmings.

Worcester, Mass.—At a recent meeting of the committee on new enterprices of the Worcester Board of Trade, it was proposed to build at some desirable location in Worcester, a cold storage warehouse with immediate capacity of 300,000 cubic feet, and with opportunity for future enlargement. It was estimated that land and building would cost about $70,000. Charles E. Lee, of Boston, was appointed agent to organize a company.

Washington, D. C.—Richardson & Burgess, Colorado building, have received the contract to erect the McKinley building on the grounds of the American University, at a cost of about $250,000.

It is reported that Sunderland Bros., Washington Savings Bank building, have purchased a site in Fernwood on which to erect 60 residences. Total cost, about $1,500,000.

It is reported that bill appropriating $580,000 toward construction of the Senate office building has been passed.

West Point, Miss.—It is reported that a modern opera house and secret order hall combined may be erected here, and that information is desired from competent architects and builders, as to plans, specifications and materials. Estimated cost, $60,000 to $75,000. Address H. S. Dodenhoff, Secretary of the Board of Trade.

West Point, N. Y.—Sealed proposals will be received here until May 11, 1905, for laying about 32,000 ft. of 20-inch cast iron water pipes, as per specifications on file in this office. Forms and specifications furnished upon application. Address Quartermaster, U. S. M. A.

Winnipeg, Man.—John D. Atchinson, of Atchinson & Edbrooke, architects, 90 Washington St., Chicago, is preparing plans for a $100,000 apartment house to be built in this city.

Youngstown, O.—At a meeting of the stockholders of the Youngstown Iron, Sheet & Tube Company, held recently, the directors were authorized to expend $2,500,000 for additions to their plant in East Youngstown. Plans and specifications for these improvements have already been prepared, submitted to the stockholders and approved. Contracts will be awarded very soon and work pushed as rapidly as possible.

NOTES AND CLIPPINGS.

COPPER AS A LIFE-SAVER.

Copper Sulphate as a Clarifier of Water and Sewage.—In a bulletin soon to be issued from the Department of Agriculture, Dr. George T. Moore, in charge of the laboratory of plant physiology, reiterates much more emphatically the position the department took last Summer in regard to the cheapness and practicability of the use of copper in preventing or removing algal and bacterial contaminations from water supplies, and recommends methods of procedure, as the result of experiments in many lakes and reservoirs. The prejudice against the use of copper sulphate is met with authority and knowledge gained by direct experiments. So successful have the experiments been that methods of purifying water in the home receive much space. While the effect of copper sulphate in removing and preventing algæ is regarded as important, the use of the compound in purifying water contaminated with typhoid fever bacteria has attracted more attention, and in many cities the result of experiments is being watched closely, with a view of possible adoption. The bulletin says:

"Experience has demonstrated the practical value of copper sulphate as an agent for the purification of contaminated water, and it is believed that most of the important conditions likely to obtain have been encountered and successfully dealt with. Treatment with copper sulphate is an effective and practicable means of sterilizing water polluted with certain pathogenic bacteria, and, as an emergency method, is applicable to both household and municipal conditions. It should prove particularly useful in large water supplies accidentally or suddenly contaminated with typhoid bacilli which are not provided with any adequate means of purification. Under such circumstances the case becomes not one of pure water versus water containing an amount of copper sulphate, but of sterile water containing an amount of copper not dangerous to health versus water and typhoid bacilli. The method formerly suggested for testing a reservoir would undoubtedly be advisable in special cases of unusually great contamination, when the water contained an abnormal amount of organic matter, but, in general, an epidemic could be controlled and quickly eradicated by a solution much weaker than the 1 to 100,000 listed as necessary for complete sterilization within twelve hours. One to 2,000,000 is sufficient in most cases, and even less than this quantity of copper is of decided benefit in certain kinds of water."

Attention is also called to the use of copper in the disposal of sewage. The case in connection with filters is urged. About the use at filters the bulletin says:

"It appears from the examination of a

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considerable number of filters in this country, that the officials in charge of municipal waterworks are not justified in assuming that filtration is the absolute guaranty against a disease-laden water that it is popularly supposed to be. The number of unavoidable accidents which are known to occur in properly managed filters, to say nothing of the wilful and sometimes criminal methods resorted to in order to bring the supply of water up to the daily demand, are factors which are not generally considered by the public. At the present time the only known method of immediately rendering a contaminated water supply safe and keeping it so until the source of pollution is removed seems to be the use of copper. This treatment is not designed to supplant efficient filtration, however, and should never be expected to take its place. The use of copper for removing a temporary contamination is necessarily a remedy, and should be used as such. The existing methods of sewage disposal and water purification are particularly unfortunate. To deliberately contaminate a water and then try to purify it seems ridiculous, yet this is precisely what is now being done in a number of communities. The ultimate solution of the problem of water supply must depend upon proper sewage disposal, as well as the proper care and policing of the water sheds and wells. Until this revolution of methods shall have taken place, the makeshifts filtration and treating with copper are the only remedies applicable on a large scale."

Windmills for South Africa.—Owing to the continued dry seasons in South Africa, which have caused the destruction of large droves of cattle, a large demand for pumps and windmills has sprung up, says Mr. J. F. Monaghan, Consul at Chemnitz, Germany. The sinking of wells has become a pronounced necessity. Even the government boring machines have been called into use to supply cattle with the necessary quantity of water to sustain life.

Two kinds of motors are salable, a light one for pumping water for cattle and a heavier one to pump for irrigation purposes. Of the first kind there is a great variety on the market at Cape Town. The main points considered in purchasing such motors are lightness combined with great capacity, facility of removal from one place to another, and ability to be set in motion by the lightest breeze. Windmills answering these conditions are at the present time very scarce. It is conceded that the American-built windmills are by far the best. German and Austrian manufacturers, however, are doing all in their power to get control of the South African market. It behooves our manufacturers, therefore, to give strict attention to this market if they wish to hold it. Care should be given to the packing and shipment of goods. Duplicate parts must be at hand so that broken machinery can be repaired at short notice. This is a point to which German manufacturers give special attention.

It is necessary for our manufacturers to be up and doing; otherwise the Germans and Austrians will be making disastrous inroads into the South African market in the lines mentioned.

The Rights of Female Art Students at Berlin.—More than 200 women art students are up in arms against Director von Werner, who refuses to admit them to the Academy of Art. In a petition sent to the Prussian Minister of Education the women demand admission on terms similar to those now accorded them at the universities. The decision of the Minister is awaited with considerable interest, as it will establish a precedent in other State art academies in Germany that still exclude women.—*Exchange.*

Rational Forestry.—During the discussion following the reading of a paper on "British Woodlands," by the Right Honorable Sir Herbert Maxwell, before the Society of Arts, Sir Dietrich Brandis, K.C.I.E., said the great truth that trees in order to yield valuable timber must grow in thick masses where they drew each other up to the greatest height an individual tree could attain, and where, at the same time, their close contact prevented the formation of branches, which was the chief thing to teach those who managed woodlands in this country, had been admirably stated by the author. Another point which had been equally well set forth was that certain trees required a mixture with other trees in order to thrive. If the oak trees in the Forest of Dean had been grown in company either with beech or silver fir, they would have presented quite a different appearance from their present miserable state. In 1865, on his first furlough home from India, with the enthusiasm of a young man, he visited a great many of the woodlands in England and Scotland, including some of the finest coppice woods of ash and sweet chestnut which he had ever seen in his life. The owner told him that he had used the best wheat land and raised very strong seedlings, managed the land under a rotation of seven years, and produced hop poles which were in large demand in those days, the land thus yielding him £5 an acre net. It was very difficult not only in England, but in other countries to obtain the financial results of the forest management of private estates, and that was one of the chief reasons why States and private individuals did not take the question up. The communal forests in Germany were the staple of the wealth of the country, and the Crown forests of this country might be made extremely valuable as object lessons of rational forestry if they were properly managed. The plan which the author had foreshadowed would do an immense deal towards making people familiar with the idea that the planting up of waste lands was profitable. The timber merchants in Saxony, Bavaria and other parts of Germany were able to make their plans in advance because they knew every year that each forest range was expected to yield a certain quantity of timber of a certain kind, while in England there was no regular yield which enabled the timber merchant to frame his plans, and consequently he found it more convenient to make arrangements for buying the timber at the port where it arrived from abroad. It was interesting in connection with rabbits, to state that in Richmond Park young oaks were now coming up under the oaks which were standing very far apart. This would have been impossible when millions of rabbits were allowed there.

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[*For Alphabetical Index see Page 2.*]

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